American Artisan

THE WARM AIR HEATING AND SHEET METAL JOURNAL

FOUNDED 1880

The Keynote Will Be MERCHANDISING

Here are a few of the outstanding subjects that will be discussed in the 50th Anniversary (December 20) Issue:—

- Historial Section (Pictorial). Old installations of copper, tin, galvanized and black metal, aluminum, lead and zinc, as well as typical old heating installations as used in homes, schools, factories and public buildings.
- Direct Mail Advertising.
- Credit.
- Oil Burner Sales Methods.
- How a $317 advertising campaign pulled results.
- Use of dealers' name plates.
- Turnover, what it means in merchandising.
- How a furnace man became the leading oil burner dealer in his town.
- How a warm air dealer sells $1200 to $7700 gas furnace installations.
- Start of a series on "Making Money in the Heating and Sheet Metal Business."
- Improving window and shop displays.
- A Merchandising Almanac—a business building idea for every week in the year.
- How to plan the year's business to make more money in 1931.
- Planning the year's advertising.
- How to make effective use of manufacturers' dealer helps.
- Descriptive (illustrated) articles featuring unusual heating and sheet metal installations.

Watch for it . . . . . Keep it for reference

DECEMBER 6, 1930

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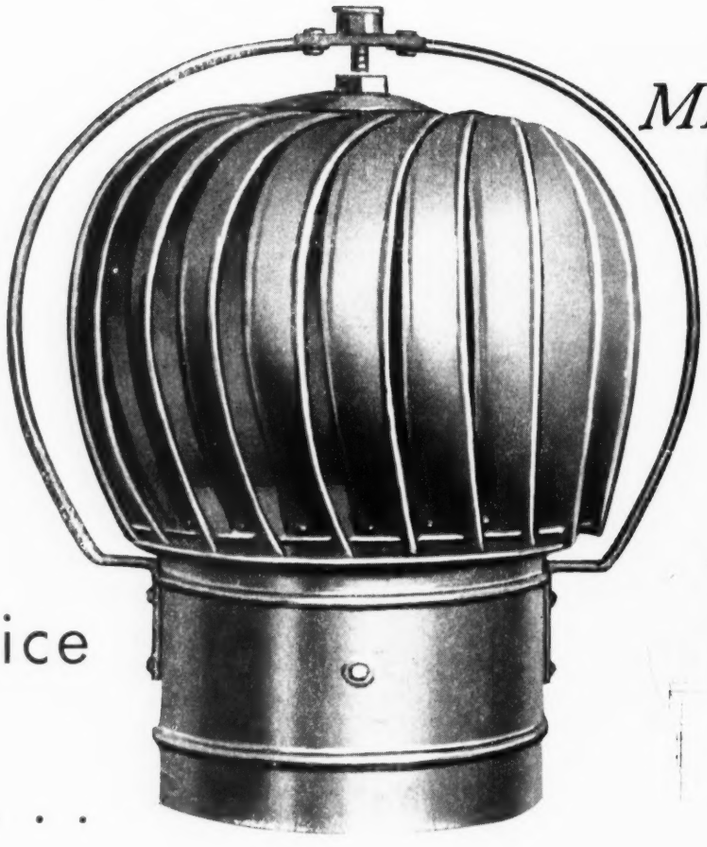

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GENERAL OFFICES: ROME, N. Y.

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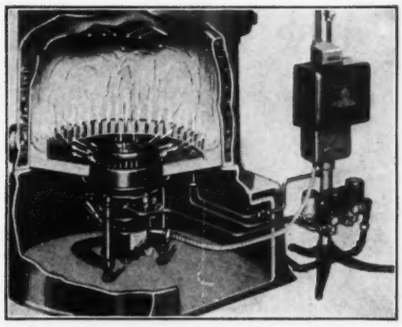
INDEX PAGES—8 and 56 **[VOL. 99, NO. 25—$2.00 PER YEAR]** **BUYERS' DIRECTORY—52 and 54**

Like the Siamese Twins

. . . "SILENTS" and warm air furnaces should always be TOGETHER



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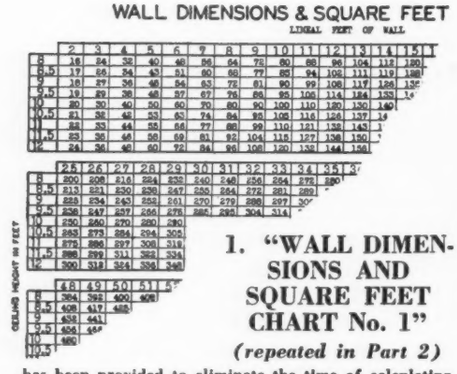
(372)

Determine Heat Requirements with Speed and Accuracy

with Allen's Standard Code Computing Charts

HERE at last is a really simple and accurate method of quickly figuring Standard Code heating requirements in any building. After taking room, wall and glass measurements, all you need do is consult the proper charts and total the result for your basement pipe areas, with little chance for error.



1. "WALL DIMENSIONS AND SQUARE FEET CHART No. 1"
(repeated in Part 2)

has been provided to eliminate the time of calculating the square feet of wall. The foot note gives instruction for using this chart.

With this book of charts, men of little experience in the heating business are able to estimate reliably. Salesmen can determine the proper furnace and pipe sizes within from three to five minutes. The thoroughness and accuracy of this method inspires the confidence of the prospect in your recommendations, thus reducing sales resistance and eliminating low price competition.

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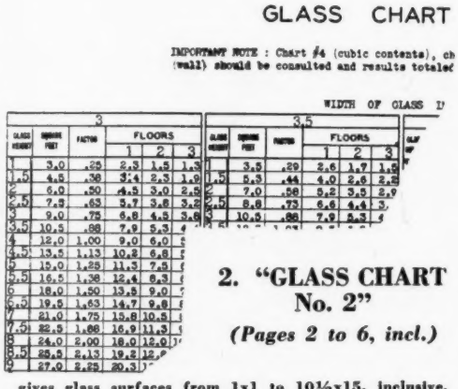
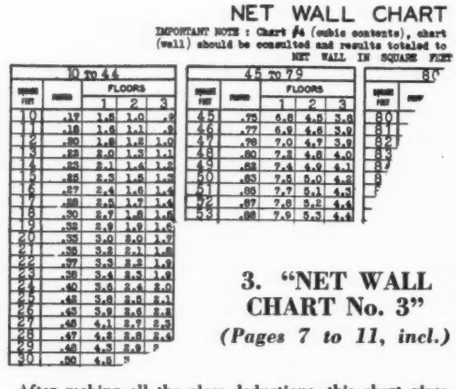


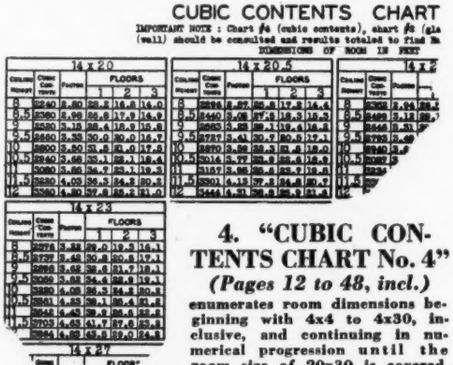
2. "GLASS CHART No. 2"
(Pages 2 to 6, incl.)

gives glass surfaces from 1x1 to 10½x15, inclusive, with square feet, factor, pipe area, for first, second and third floors, in square inches of piping.



3. "NET WALL CHART No. 3"
(Pages 7 to 11, incl.)

After making all the glass deductions, this chart gives the net wall in square feet, factor, pipe area, for first, second and third floors, in square inches of piping.



4. "CUBIC CONTENTS CHART No. 4"
(Pages 12 to 48, incl.)

enumerates room dimensions beginning with 4x4 to 4x30, inclusive, and continuing in numerical progression until the room size of 20x30 is covered. The object of the small dimensions is to take care of sun porches, halls, and irregular room sizes. In these pages, with a given dimension, the following information is indicated: ceiling height, cubic contents, factor and pipe area for first, second and third floors in square inches of piping.

"EXPOSED WALL CHART No. 1"
(Pages 2 to 36, Part 2)

are for use instead of "Net Wall Charts" where walls are not of standard construction (frame wall containing siding, paper, sheathing, studding, lath and plaster and factor 60 used) or where floors or ceilings are exposed. 35 Tables of different construction—wall, ceiling, floor and insulation. By considering the construction of the building, the Engineer will be able to make a great many sales which he would not otherwise, if he dwells particularly on the type of construction as contrasted with a competitor who figures all buildings the same, regardless of the type of construction.

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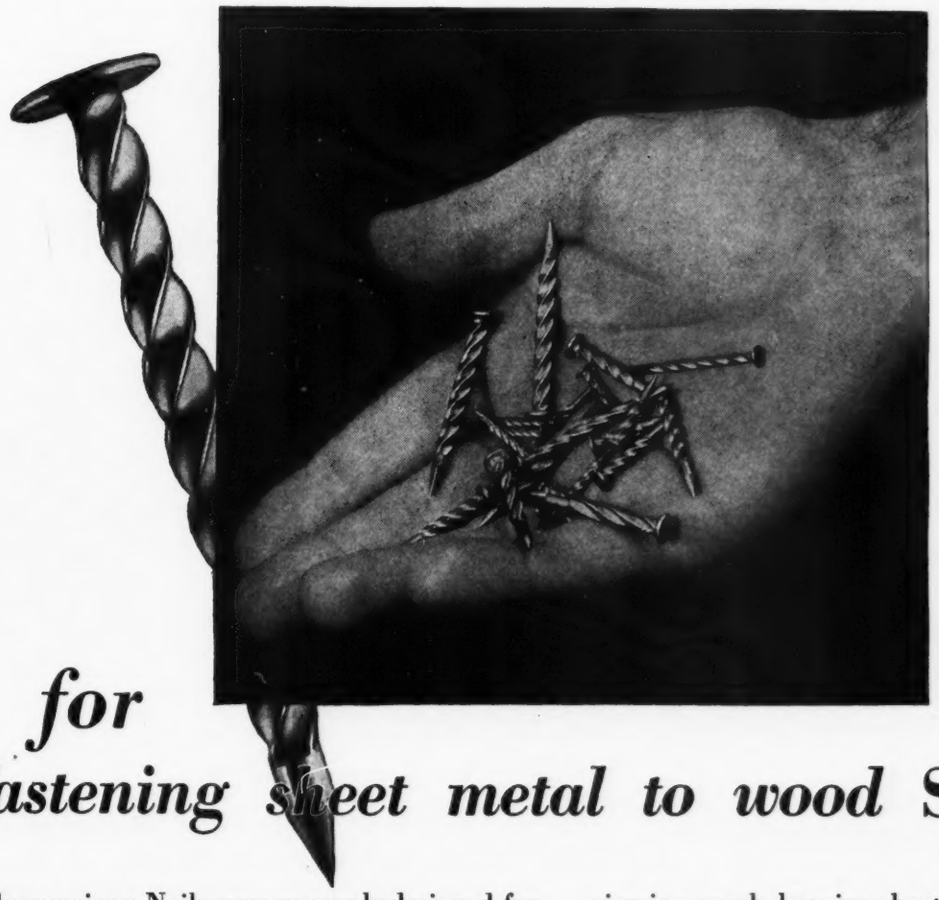

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Founded 1880

American Artisan

THE WARM AIR HEATING AND SHEET METAL JOURNAL

Published Every Other Saturday

Covering All Activities
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Gravity Warm Air Heating
Forced Warm Air Heating
Sheet Metal Contracting
Air Conditioning
Industrial Roofing
Merchandising
Ventilating

YEARLY SUBSCRIPTION PRICE:

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VOL. 99, NO. 25

DECEMBER 6, 1930

There's a mighty interesting article by Platte Overton in this issue. It tells all about the design of a commercial garage heating and ventilating system. Here is a class of work where there is still an excellent profit—but you have to know your stuff if you are going to keep your shirt on your back.

* * *

You may not have thought of it, but the east is not using sheathing steel for its construction work as it once did. The great southwest, however, is right now in the midst of its first expansion programs and buildings built in a hurry are needed. One story tells how a heavy sheet working plant is making money out west.

* * *

And last, but not least, we are, of course, reporting the meeting of the National Warm Air Heating Association, held December 2 and 3. It was a lively and very satisfactory meeting. Many things were accomplished and the whole spirit of the meeting was more optimistic than at the spring meeting.

Contents

PORTER-SPOFFORD-LANGTRY CORPORATION
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FRED D. PORTER, *President* **JOHN C. LANGTRY,** *Vice-President* **HOWARD H. BEDE,** *Secretary*
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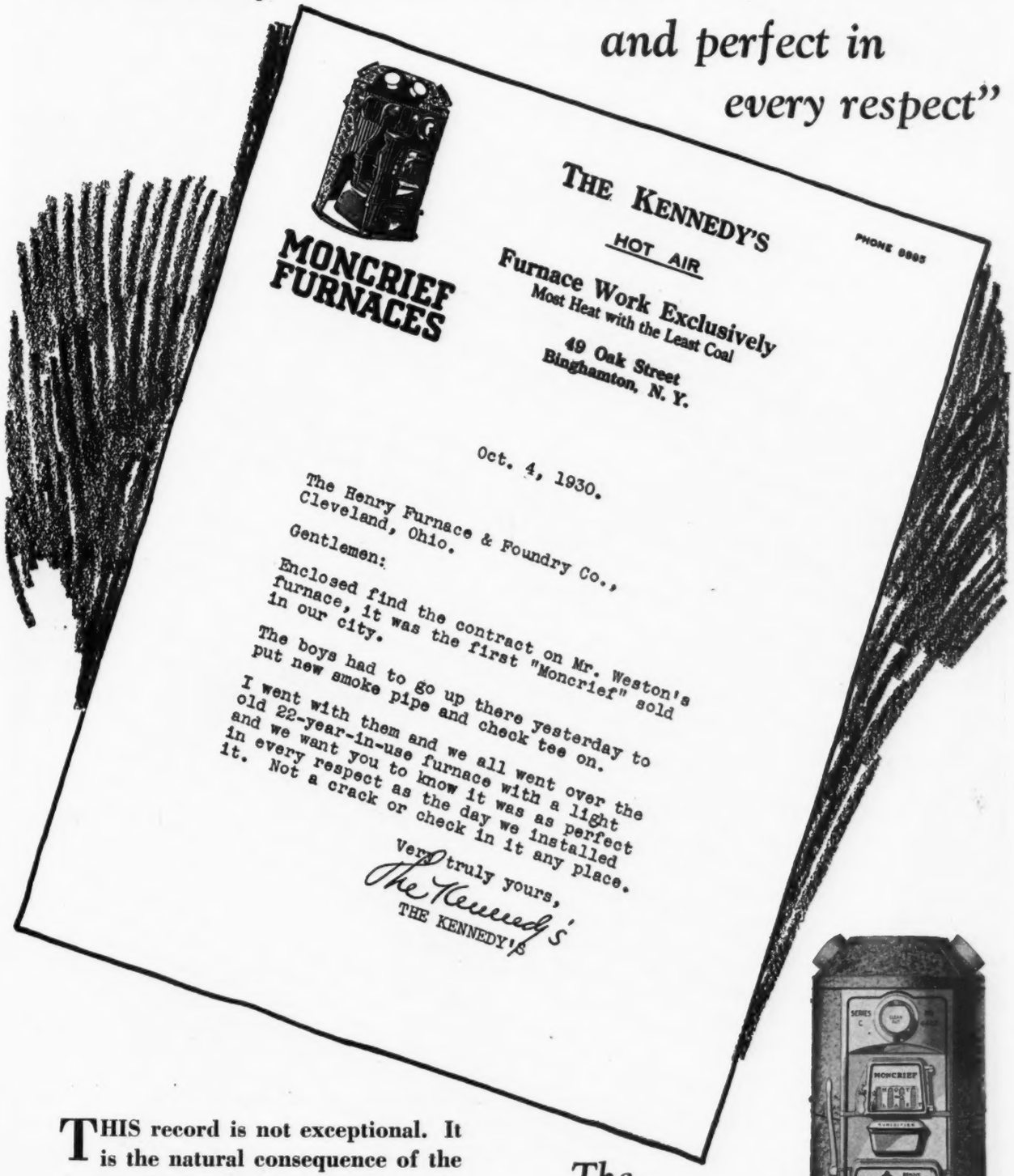

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American Artisan

THE WARM AIR HEATING AND SHEET METAL JOURNAL

139 NORTH CLARK STREET CHICAGO

FOUNDED 1880

"Its Keynote Will Be Merchandising"

That's what our editor said when I asked him what in particular would be featured in our Golden Anniversary Issue of December 20th.

"Merchandising," he said, "must be the big job of the future and AMERICAN ARTISAN will continue to make Merchandising the Keynote not only of this Annual but every issue thereafter, although of course, we are not going to neglect the technical and business ends of our great industry."

In the SHEET METAL Division of this Annual we shall illustrate interesting jobs in copper, galvanized iron, sheet steel, aluminum, lead and zinc, showing their successful and enduring use in homes, schools, factories, public buildings, etc.

Photographs of actual installations have been gathered by our staff, and we will show how some contractor has successfully merchandised his service and his products.

In the HEATING SECTION, every phase of warm air heating—coal, gas, oil, forced air—will be treated from the merchandising and installation standpoint. Nothing theoretical but genuine stories and photographs and plans of successful installations showing how they were figured, sold and installed.

Establishment of credit, direct mail, turnover, window display, improvement of shop and show room—all will form an interesting part of this Annual, and the best part of it all is the editorial policy of this Annual will continue to be the keynote of every one of our 26 issues in 1931.

Yours for Renewed progress and prosperity in 1931

E. C. Kuhn

Manager

American Artisan

THE WARM AIR HEATING AND SHEET METAL JOURNAL

Vol. 99 CHICAGO, DECEMBER 6, 1930 No. 25

There's Some Hope for 1931!

AS the year 1930 comes to a close, let's look back over the last twelve months to see what the year has done for the heating industry and try to forecast some of the things we may expect during 1931.

This last year has been a period of economic depression. Practically all our staple business has fallen off making it necessary for anyone wanting business to get out and hustle for every dollar.

We can't really say that the public's actions have been anything but natural in a period when everyone has either been forced to live on a reduced budget or are afraid they may be.

This feeling of uncertainty, we feel, is responsible for reduced business. Hundreds of thousands of wage earners have either had their income cut, or fear it will happen. Business men generally have suffered from this and their expenditures, in turn, have been cut down.

The result has been that new construction and reconstruction have fallen off. People this last year haven't been building new houses and when possible have put off alterations. No industry which depends upon construction can hope to have a good year in the face of such a situation. There is no reason, therefore, to expect anything but curtailed business in a time like 1930.

We have witnessed this year repeated forecasts for better business by the highest authorities in the country. Generally speaking these forecasts have done little else than make people feel that our leaders don't know what they are talking about. We have also seen much prediction that the turn of business is just around the corner. Too many of us have pinned our hopes on this feeling and sat down to wait for business to pick up. It hasn't.

But it would seem that one thing has happened. People have somehow pulled through the year. For millions the dreaded blow has not fallen. Now they are beginning to feel that perhaps they can spend a little money without the heavens falling. With this thought in mind they are beginning to plan conservative expenditures.

In most cases some cautious spending will take place during the next few weeks, if for no other reason than that it is the holiday season. Probably this spending will bring happiness and whet the appetite for some more spending. Additional cautious spending will occur during the first months of next year to be followed, if business doesn't get any worse, by additional spending.

We must face the fact that in most communities housing is not a problem. There are more places to live than tenants for the places.

But in the field of reconstruction, cautious spending will undoubtedly pull into the construction field new money which has been hoarded this past year. It is up to our industry to make a play for the reconstruction dollar.

At the same time we can be sure that every other industry will also be after this dollar and many of these industries will use powerful advertising campaigns and the very latest of desire appeals to get the public to spend its money for their product.

There is little doubt but that the money is there.

It would seem, then, that there will be more spending next year, but it will not be careless spending. Every dollar that goes out of the public's pocket will have to be forced out.

What are our chances to get part of this dollar?

First of all we have a splendid field to work in. The public was just getting interested in heating when this depression came along. They have not lost interest in heating, but will spend only when urged to do so in terms of what spending will do for them in comfort and convenience.

1931 should be a good year for accessories. If the contractors will go out and sell new registers for appearance, automatic control for convenience, forced air for comfort, automatic heating equipment for the lazy folks, and that is everyone, alteration work which will bring economy and added convenience, and new heating plants whenever possible, we should get our part of the money which will be spent in 1931.

It is not going to be easy. Anyone who sits down and waits for the public to walk in will have a tough year. But the contractor who will get out and *sell* is going to get more business and with less effort next year than he did in 1930.

National Warm Air Heating Ass'n Discusses Many Issues of Vital Importance to Industry

MANUFACTURERS, contractors and speakers who attended the winter meeting of the National Warm Air Heating Association, held in Columbus, December 2 and 3, were rewarded by hearing one of the livest and most interesting series of addresses and discussions yet held.

There were numerous important and vital subjects on the program and every one of these was handled in a manner which kept interest at a high pitch.

In the business part of the program probably the most important feature was the report of the Better Business Committee. This report covered several developments of vital interest to every manufacturer and dealer.

The high point of this report was the resolution presented by I. L. Jones, Chairman, recommending that the President appoint a committee to meet with a similar committee from the Institute to formulate a plan whereby the two organizations can join hands and work for all common causes. In presenting the resolution the committee pointed out how the interests of the two organizations are closely parallel and how co-operative effort could probably accomplish more easily many of the things each organization has heretofore tried to do individually.

The Better Business Committee also reported that discussions were being held on the advisability of preparing an Installation Handbook. This important step will be voted upon at the April meeting also.

During the past year, the report stated, a wider use has been made of the various forms, charts and blanks for the dealer. Jack Stowell, special representative has been active since the spring meeting and has addressed conventions and gatherings of dealers all over the country. He has also represented the association and addressed gatherings of such allied industries as the coal dealers and others.

"What is salesmanship?
"Salesmanship is getting people to buy the things they desire NOW.
"That is just what the warm air heating industry needs lots of. It has always needed more merchandising sense, but under today's conditions the need is a hundred times more urgent."
—W. B. Burrus.

The meeting was opened by an address of welcome by President Triggs. The President told of the progress which has been made since the last meeting and announced that the association was now well established in the new offices.

W. B. Burrus Talk

Arthur Lamneck, newly elected representative to Congress from the Columbus district was called upon, but asked that W. B. Burrus of Washington be allowed to speak in his place.

Mr. Burrus in a short address, stated that from all reports business seemed to have reached bottom and that a gradual but steady improvement should occur.

The big need today, he said, was for everyone to buckle down and solve the problems confronting business. Don't put off these decisions, he urged, for postponement will not help pull business out of the depression.

Every industry today, stated Mr. Burrus, needs salesmanship. He defined salesmanship as getting people to buy the things they want *now*.

L. M. Markle, secretary of the National Sheet Metal Contractors Association brought the good wishes of his organization.

Swatting the Pessimist

A very inspiring address was given by Dr. Stanley L. Krebs of New York. Dr. Krebs' subject was "Swatting the Pessimist."

There is nothing more insidious, said Dr. Krebs, than the man who whispers or spreads pessimism. This form of destruction is difficult to combat because it is so widespread. The person who goes around spreading destructive reports about conditions he is little qualified to judge, can do more to tear down good times than all the Russian wheat dumping, French gold hoarding, or communistic utterances we hear about.

Every person should appoint himself a committee of one to fight this evil. The only argument needed, said the doctor, is the simple statement, "America has always had troubles and overcame them, America now has troubles and will overcome these."

There is nothing mysterious about this depression. The whole world

is in a state of sag, with Europe at the bottom of the sag and America struggling up the sides.

Two reasons for our depression are—first, a paralysis of waiting, and, second, an inferiority complex. Every local movement to bring about a relaxation of this paralysis should be backed by every business man. If every man tries to be optimistic, relaxed thinking will come about and this will bring renewed buying.

Air Conditioning

One of the most interesting addresses of the first day was the discussion on air conditioning by Dr. E. Vernon Hill, publisher of the Aerologist, Chicago. The progress of home heating was depicted by slides showing man's advancement in heating from the first primitive fire in the open up to the present-day air conditioning plant.

Defining air conditioning, Dr. Hill said that even radiator heat was one phase of air conditioning, but that to be really complete we must be able to control air conditions so that any desired temperature, humidity, cleanliness or cooling effect might be obtained.

In this matter of conditioning air three factors must be taken into account — heating, ventilating and air conditioning. The public understands air conditioning, because our theatres, stores, offices and many varied places of business and amusement are using air control to bring people to their establishments.

It is only natural, then, that people are saying, "Why can't I have a system like this in my house." If the public wants this badly enough, said Dr. Hill, they are going to have it, and it only remains to see who is going to supply the public.

Many of the related subjects were briefly touched upon in this address. Such important discoveries as the increase in hemoglobin under reduced atmospheric pressure and the curative powers of increased pressure, the medical benefits of replacing nitrogen in the air by other gases, and effects of radiant heat were brought out and touched upon.

"What we need right now to help more and better fan business is for manufacturers to tell us what their fans *won't* do.

"There is too much guessing at capacities, efficiencies, and operation under actual operation.

"We don't care what a fan will do running free in the open air, what we want to know is what it will do when it is bucking the resistance of an *average* heating plant."

—G. A. Voorhees.

The afternoon session was opened by H. A. Glover, chairman of the Committee of Ten. The organization of this committee was related, the aims of the organization were explained, and an appeal for the closest possible co-operation between the committee and our association was made. Full details of the work of this committee have been published in AMERICAN ARTISAN and need not be retold here.

E. B. Langenberg told how such co-operation has been established in St. Louis and explained the benefits which have come from this related work.

Forced Air Heating

One of the addresses which aroused great interest was the talk on Forced Air Heating by G. A. Voorhees. Mr. Voorhees covered several of the points he has explained in detail in his series "Fan Fundamentals" which has been running for some month in AMERICAN ARTISAN.

This remarkable statement was made by Mr. Voorhees: "The public wants and is demanding forced air heating. Whether or not the contractor believes in forced air is not going to matter. What the public wants, it gets; and the sooner heating contractors prepare for selling forced air, the better off they will be."

Using a blackboard for illustrating his points, Mr. Voorhees explained the difference between a "booster" and a "pressure" fan. He told how each type could be used under certain conditions and where they fell down.

"If pipes are large, short and straight, a 'booster' fan will bring truly remarkable results," said Mr. Voorhees, "but where runs are long or crooked or the pipes just large enough to get by, only a fan which builds up a pressure will make a forced air system." From his long and varied experience as an engineer, Mr. Voorhees illustrated his points with specific jobs where trouble had been overcome.

One statement brought many nods of assent from members. "What we heating men want and need is accurate and truthful operating data on fans when used in an average heating system. Free air delivery means absolutely nothing, for a fan which is said to deliver 1200 c.f.m. in the open, but which only delivers 680 c.f.m. in a system, does nothing but get the contractor into trouble. Contractors require and are soon going to demand some exact rating established by some unbiased agency."

Research Residence Work

In the absence of Professor Willard, Professor Kratz reported progress of work done at the University of Illinois experimental house. Some fears that the research men had reached the end of possible findings was denied by Professor Kratz, who said that enough work for several years lay ahead. Future investigations will cover such work as tests in the conversion burner, how and what are the effects of bonnet fans, investigation of transsections, the whys and wherefores of outside air and mixed air, operation of trunk line systems, the effect of flat ducts run parallel to the floor, a study of high side-wall registers, and the effect of storm sash.

In the laboratory tests must be made on the effects of fins on furnaces, the ratio of heating surface

to grate area, the diving type flue, air filters, and underfeed stokers.

S. Konzo, special assistant, showed slides portraying some of the high lights of recent investigations. One of the most interesting of these were the tests to determine the path taken in the cold air boot and casing when a propeller type fan is used. Tests show that there are areas of turbulency and reverse air travel in a typical installation. Future tests will seek means to overcome this.

Wednesday Session

The annual banquet was held the evening of the first day's meeting. Every available foot of floor space on the large ballroom floor was occupied by filled tables. The dinner was followed by an elaborate entertainment having a variety of features from moving pictures to child dancers and Russian singers. There was no speaking at the banquet.

A. M. Daniels of Washington, well known authority on warm air heating, was scheduled as the first speaker of the second day. Because of serious illness in Mr. Daniels family he was not able to attend.

The meeting was, therefore, divided into two sessions, one for the dealers, presided over by Jack Stowell, and the second for manufacturers, under President Triggs.

Overhead Expense

Two very lively discussions were thrashed out in the dealer's meeting. F. C. Park, Trade Association's Service Company, gave a blackboard and chart talk on cost accounting, bookkeeping and the matter of figuring of overhead. As might be expected this address led to a number of questions and lively discussion.

According to Mr. Park, 90 per cent of dealers do not know how to keep books correctly. Too many contractors are trying to get by with a ten-cent store outfit and system and such procedure, said Mr. Park, simply can't be done successfully.

Most of the discussion centered around the matter of Overhead. There are, said Mr. Park, three ways to figure Overhead—first on Materials, second on Labor and Materials and third on Productive Labor. Figures were put on the blackboard showing how different sales prices are obtained by using the same costs, but figuring overhead each of these three ways. The figures given are the same as those Mr. Park used in his article on Overhead published in the AMERICAN ARTISAN of October 25. A large scale reproduction of the figures helped the audience to visualize the picture and the figures.

The important thing, according to Mr. Park, is not so much *how* the contractor figures his overhead, but that he *does* figure it and figure it rightly. How he is going to figure it depends somewhat on the type of business he is doing and how he has been used to handling his cost records. Mr. Park did recommend, however, that in the average sheet metal and warm air heating shop, productive labor is the most uniform element of cost and can, therefore, be used for basing overhead a little more easily than any of the others.

Quite a number of questions were asked and answered. These questions showed that figuring Overhead is demanding and receiving the attention of the progressive contractors and that improvement in this endeavor is to be expected. Mr. Park explained briefly his system of cost records which have been officially approved by the National Association of Sheet Metal Contractors and invited anyone interested to look the system over.

Fan Discussion

Immediately after this discussion was closed several dealers were on their feet wanting to ask more questions about fan work. G. A. Voorhees and Professor Kratz were present and were bombarded with questions. Homer Brundage, who has been active in ventilating work for many years, also got into the discussion and between the three authorities a large number of individual problems were settled.

In connection with fan work, a number of questions were asked about the electrical hookup used on automatic control. This subject seemed just a little vague to many members, but Jack Stowell, who was presiding, got all questions plainly presented by asking many questions. He also took a lively hand in the discussion and from his wide experience as a contractor was able to point out several ways of solving problems.

Manufacturers Meeting

At the same time the manufacturers held their session in another part of the hotel. Strange to say, one of the liveliest discussions centered around the subject of forced air heating and fans.

Professor Hoffman reported the work of the Code Committee and the report was referred to the directors for future action.

R. W. Blanchard, chairman of the Publicity Committee reported that during the past year publication of the monthly bulletin had been resumed with Allen Williams as editor. Advertisements have been run in the Home Builders Catalogue and Sweets Catalogue. No other advertising has been done. More demands than ever have been received for association literature, and also for the blanks, forms and sheets used with the Standard Code.

The Executive Committee report showed that there is decided sentiment against display of products at the national conventions. The committee also reported that the Spring meeting would be held in Columbus April 22 and 23, 1931.

The committee expressed itself as heartily approving the action of the President in appointing a committee of the association to meet with a similar committee from the Furnace Institute with the aim of correlating the work of the two associations. Another important decision was the approval of the move to incorporate the association. The organization has heretofore not

been incorporated.

Secretary Williams reported that the association is carrying on its work in credit and collection work and that enlarged service would probably be available during the next year.

Fans in Standard Code

One of the most important pieces of business of the session was the decision to begin work toward incorporating recommendations for fan work into the Standard Code. In order to get this work moving rapidly, the committee asked everyone to send in all the data available on where and how fans are to be attached to the casing, what sizes are used today and what sizes the members think will be necessary, what speeds are used and what information is available on the relation of speed to noise and long life. The committee also wants information on whether the sizes of leaders and stacks will have to be changed in fan operation or whether standard code sizing will work when a fan is attached.

Before the meeting broke up some round table discussion was held on vacuum cleaning work. R. P. Whitmer of American Foundry and Furnace Company told of the work his company is doing to promote the use of cleaning to get repair business and what sales assistance the company was giving the dealers. Fred Bissell of the National Super Service Company followed and explained the sales plan used by his company and told how there is a great need for just such a means of getting business as is offered through doing cleaning work.

The meeting adjourned at the conclusion of this discussion.

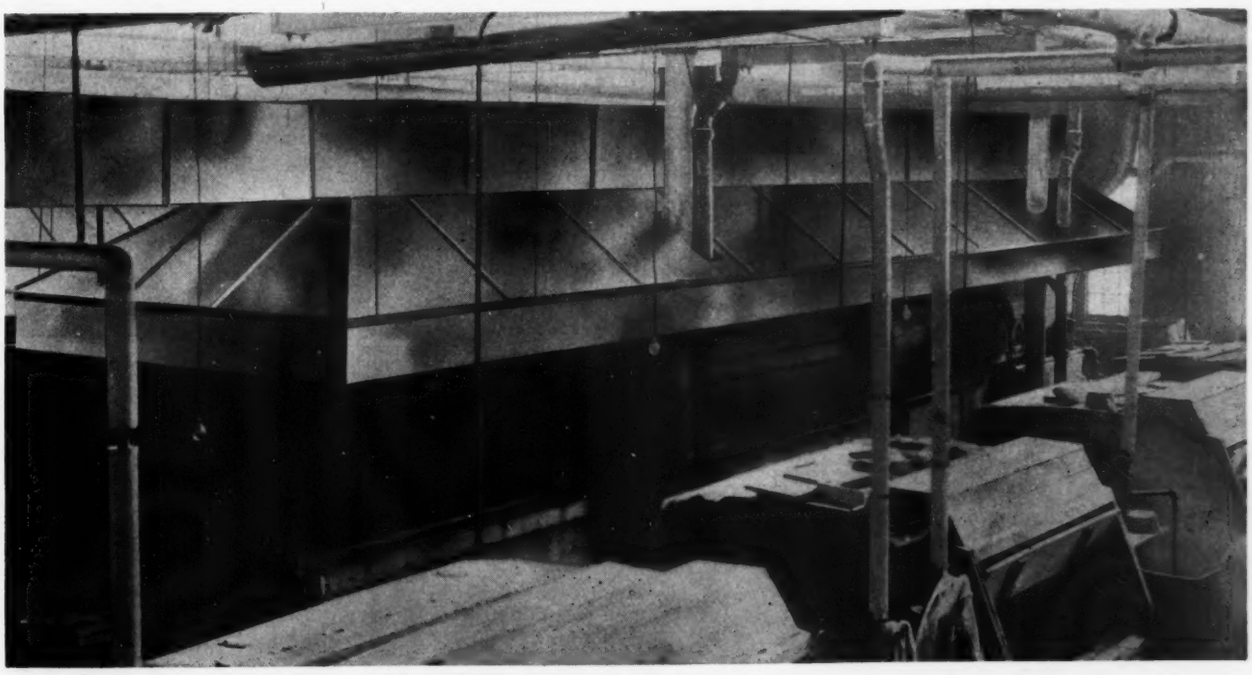
An INTERESTING DYE HOUSE FUME HOOD

THE problem of providing suitable ventilation to carry fumes from dye tanks and at the same time defeating the corrosive action of the fumes on the equipment has been solved by the Wiesner-Rapp Company, sheet metal experts of Buffalo, for a large textile plant in the vicinity of that city.

The equipment consists of a hood, ten feet long, with a tapering duct mounted upon it to conduct the fumes to the fan. Ports, six inches by twenty-four inches, in the top of the hood admit the fumes to the duct. Any condensate is conducted to a trough running around the apron of the hood and discharged to the sewer through a pipe at the fan end.

Defeat of corrosion is effected through the use of No. 20 gauge monel metal sheet for both the hood and the duct. Both are of standing seam construction, riveted with monel metal rivets and braced with monel metal bar stock.

The first unit of this equipment was installed more than a year ago but at no place is there any sign of corrosion. The inside and the outside of the hood still has the appearance of new full finished sheet except around the outside of the trough where there is a slight surface discoloration. This may easily be rubbed off with the fingers and there is no sign of corrosion.



This monel metal hood gathers fumes into the duct system above it. The fumes from the machines do not affect the metal. Construction is standing seam riveted at joints and braced. Condensation is taken care of by a trough on the inside edge

This the exterior of the Dudley Company shop and office. It is neat, freshly painted, and advertises its business

Very often owners of combination store and apartment buildings are afraid to let the warm air heating man bid on a heating job, because they think this type of heat is suitable only for single family dwellings.

Read the story and see how the contractor overcame the objections raised by the owner

A Store and Flat Heating System Built Around One Large Duct and a Fan

DESIGNING and installing warm air heating systems in store and apartment buildings is a class of work which attracts the heating man who likes to work out problems of the kind not usually found in residential heating work.

A great many heating men actually like to hunt out such jobs just because they get a "kick" out of solving the difficulties. Such a firm is the A. W. Dudley Company of Terre Haute, Indiana. This company has been doing warm air heating work in Terre Haute for many, many years and in the course of the years has done a great deal of this store and apartment heating.

There are two good heating men in this firm. A. W. Dudley is the first and he is one of the pioneer warm air men in his part of the country. The other member is equally well known—Frank Anderson, the 1929 president of the Indiana sheet metal and warm air heating men's association and like Mr. Dudley also one of the pioneers in heating in Indiana.

One of the store building jobs this firm recently completed entails not only the heating of the store floor, but also the second floor which is divided into apartments. In addition to this part of the problem, there was also the difficulty of carrying the warm air through a long duct system, and getting the warm air to the second floor when there really wasn't any partition or wall space deep enough to take the stacks. How these problems were worked out is told in this article and shown in the photographs and drawings which accompany the story.

The first floor contains two stores. On the outside is a drug store and on the inside a grocery store. The partition between these two stores is thin and in order to get heat to the second floor a deep stack was absolutely necessary.

The owner of the building wanted to use warm air, but because of conditions he had been told that the only practical way to heat the building was to put in a complete hot water system. In addition, the basement was only 6 feet 2 inches between floor and joist, leaving almost no space for taking off any warm air leads from a furnace, even a low one. And in this case a large size XXth Century furnace was required. To add just another complication the people running the drug store did not want their expensive equipment torn up and disarranged to accommodate a large stack.

In the beginning the job looked rather hopeless.

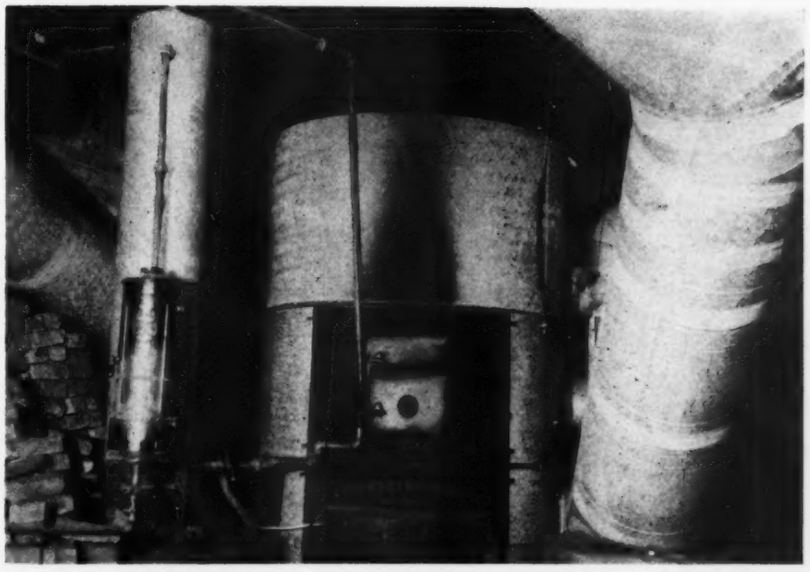
After some thinking and tearing up several suggested layouts the system was laid out as shown. One of its greatest features is its sim-

plicity. The whole system is based on one large warm air lead through the basement, one large stack to the second floor and three short and not very large return air leads from the first floor.

In order to get in a large enough furnace, a pit had to be sunk in the basement floor. In order to get warm air through the long basement duct a forced air system was devised. The pit was made large enough to accommodate the furnace and the fan housing and give enough space in the front to make firing possible. The system uses hard fuel.

An extra high bonnet of the round, flat top type was made for the furnace. No leads were taken off except for a large rectangular duct at the back. This bonnet shows in one of the photographs. The large duct was taken through a low space between the first floor and the basement floor to a point about half way back. Here one branch continued straight on for a short distance and ran up the store partition wall, which is masonry and heavy, and then on back to the end of the basement. The layout of the system is shown on one of the drawings.

One of the ways devised to reduce the number of leads necessary and also the number of stacks in the walls was to use a double headed register off each stack. In this way one face opens into the drug store and the opposite face into the grocery store.



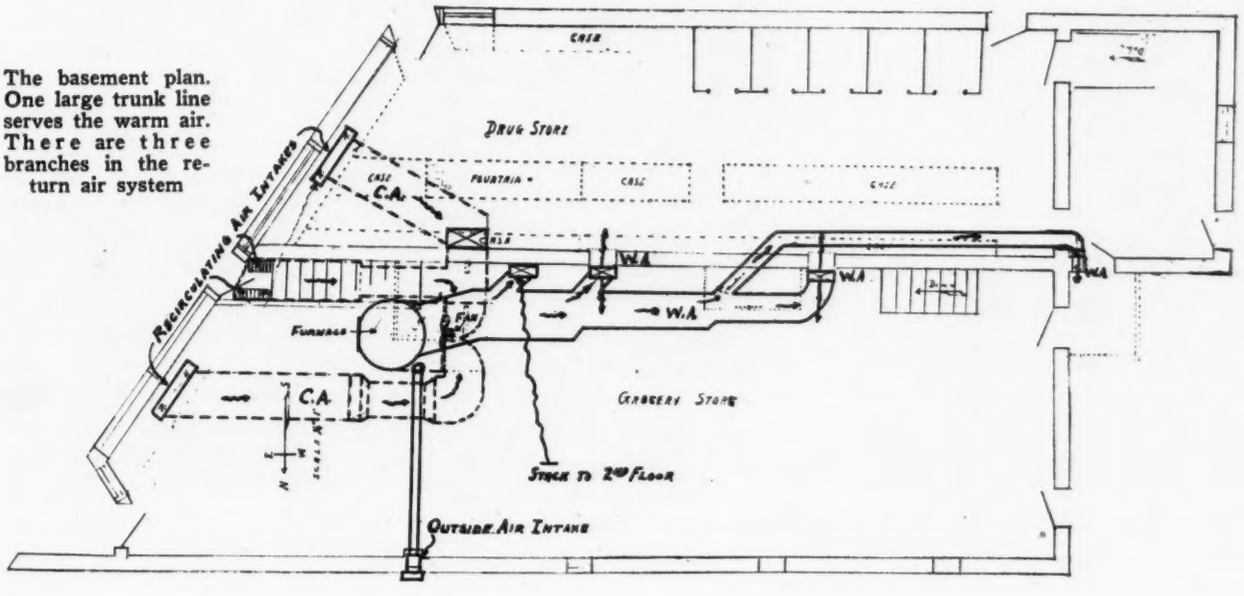
The front of the heat plant. The furnace sits in a pit. The return air system, shown, is flat duct to just above the furnace, where the air is chuted into the casing through round pipe. The fan and warm air duct are located in the rear. Note the high, round bonnet. Only one rectangular warm air lead is taken off this bonnet

Because of the show cases which lined the walls of both the drug and grocery stores, the stacks for the first floor were carried up 7 feet 6 inches above the floor and opened out through wall registers. These faces are on inside walls and are on about the one-third points of the partition.

The stack to the second floor has several interesting features. The operator of the grocery store permitted the heating men to take the large stack through his store, since the location they had chosen did not interfere with his merchandising layout. The stack continues right up through the second floor and as a stack on up through the hallway of the second floor to the second floor ceiling. Above this ceiling there is a very shallow attic space and through this space a single duct line with branches was run to carry heat to the rooms. The space was just about deep enough to take the duct, so to eliminate all danger the duct was insulated against heat loss.

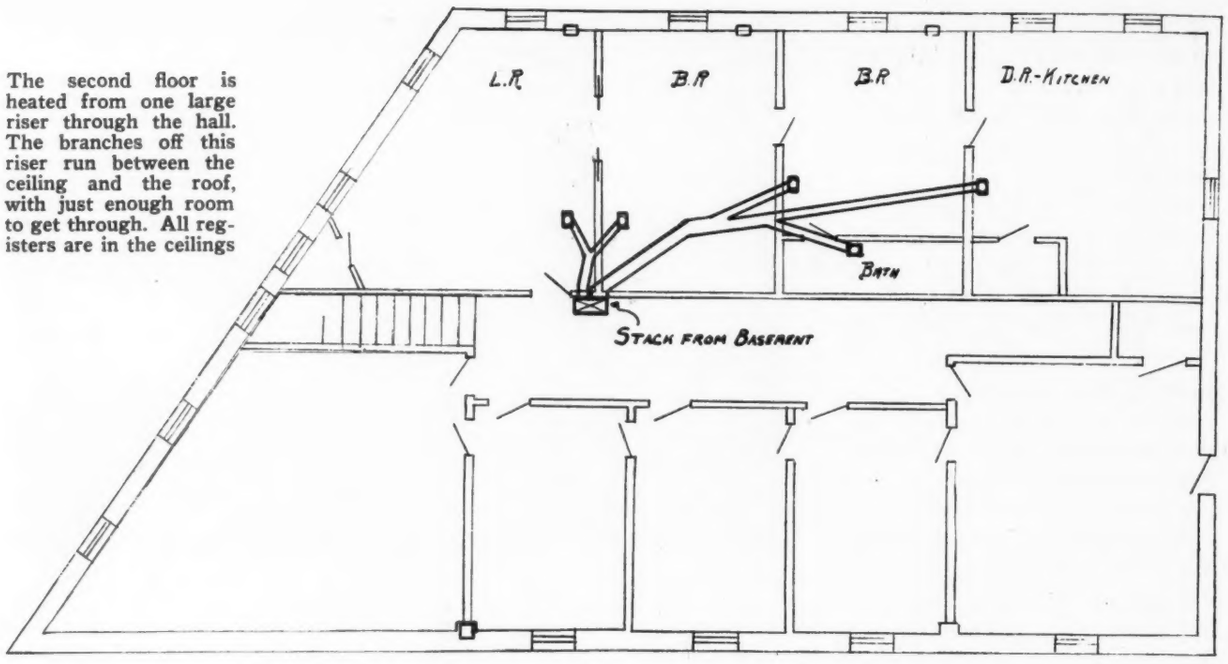
A master damper for the entire second floor line was placed in the stack in the second floor hall.

The line branches out over the



The basement plan. One large trunk line serves the warm air. There are three branches in the return air system

The second floor is heated from one large riser through the hall. The branches off this riser run between the ceiling and the roof, with just enough room to get through. All registers are in the ceilings



-SECOND FLOOR-

ceiling in two main leads with two branches off one main and three off the second. All the registers on this system are of the ceiling type with chains to permit shutting the registers.

The return air side of the system takes air from both first floor stores, but no air from the second floor. However, two large grilles are placed in the vestibule floor at the foot of the stairs and most of the air from the second floor is taken care of by this line. Each grille in the stores is housed in the face of a show window floor. Both grilles are fairly close to the doors and at the front of the stores where there is the greatest exposure. The three return air lines end near the furnace and from the end of the duct to the casing round pipe is used. This shows clearly on the picture of the heating plant.

On the heating system layout there is shown a small outside air intake line from the north side of the building. This was used for two purposes. First, to give some percentage of fresh outside air and second to increase the weight of the cold air to assist the movement of the air through the long ducts.

The draft and check for the furnace are controlled from the first floor and on this plate a switch for the Miles fan was also installed. The fan does not work automatically. The check and draft can be operated without the fan, or the fan can be turned on without changing the draft of the furnace. While this system is not so economical and fool-proof as the automatic type, it has been through some cold weather without causing any complaint on the part of the owners. As a matter of fact, the owners think the system is just about the finest piece of heating work they know of.

Last summer when the thermometer was flirting with the 100 mark, the drug and grocery men were kept quite comfortable by turning on the fan and letting the air circulate through the stores. While the system was not devised for summer cooling and the fan is not geared for summer work, quite a noticeable effect was attained through getting the air into circulation.

Too many heating men think that any job larger than a house should be complicated. As a matter of fact, the bigger the job the simpler it should be. This story illustrates this point nicely

The Dudley Company believe in doing every part of their work thoroughly. One of the things they always insist on is to see that there is adequate draft in the chimney and that there are no losses or cracks. Before work was started on the heating plant a check was made of the chimney. Tests showed that the chimney would develop only .07 inches draft which was not sufficient for the large furnace. Accordingly, the outside walls of the old chimney were torn away to receive a new 12 by 12 tile lining. The walls were then built up around the new liner.

Shortly after the installation was completed, Mr. Neukom, the owner, had to go south for his health and his two sisters, who are very capable young business women, took over the management of the drug store and building. At this time the south second floor apartment was vacant so the heating contractor closed the second floor stack damper. Some time later this apartment was occupied and the contractor called in to explain how the damper should be opened. No further servicing was necessary, which the Dudley Company believes speaks well for the ladies operating the system and for the installation also.

"No Job Too Big"

Claims Western Pipe & Steel Co., Phoenix, and Backs Its Claim With Successful Jobs in Many Industries

By **A. B. LAING**
Phoenix, Arizona

THE Western Pipe & Steel Co. branch at Phoenix, Arizona, have put real meaning into this old slogan. With the best mechanical equipment procurable and with modern sales methods this firm has, in a few years, attained an enviable position in the industry of the state.

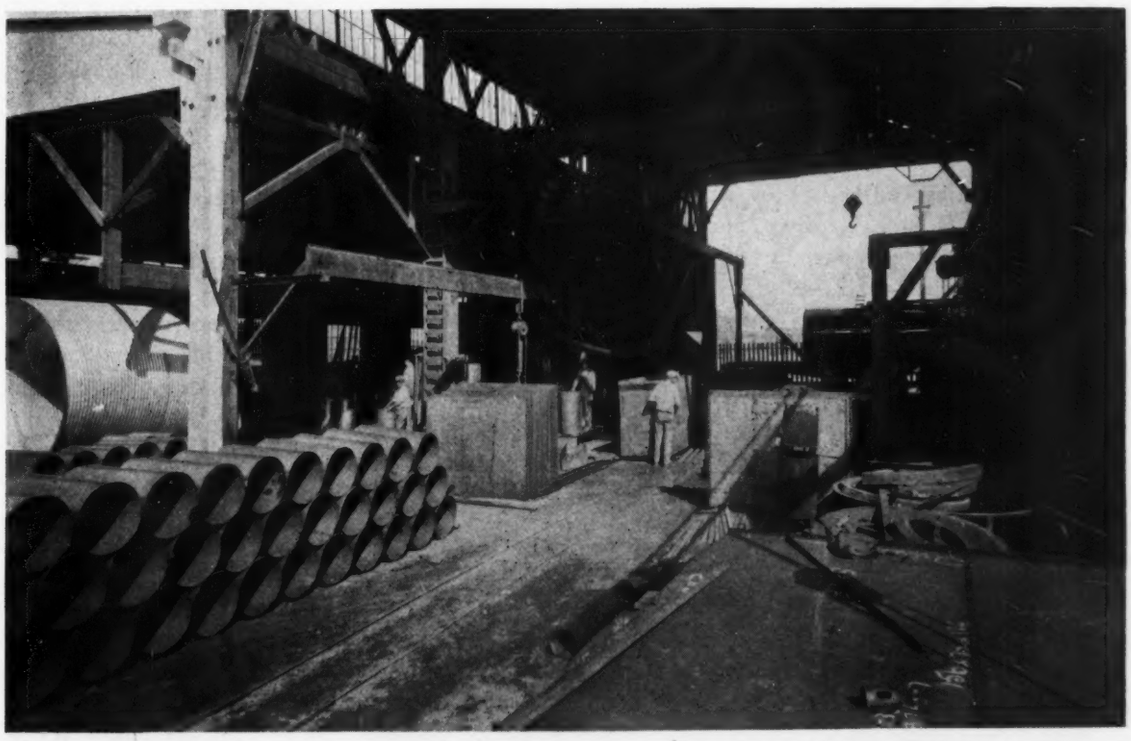
A. A. Burden, the manager, believes that the sheet metal business is similar to every other business in that to be successful there must be aggressive sales methods employed. To this end he devotes most of his own personal efforts, maintaining one other salesman besides himself.

A great deal of the manager's time is spent upon the road contacting county and state officials so as to be able to anticipate their needs for culverts and similar staple requirements. A small stock of such staple wants is kept on hand, ready-made for instant shipment.

In addition to these current requirements the company is equipped to turn out specialized work in sheet iron of any description.

Although trips in this part of the country often involve journeys of from 300 to 400 miles the mines of the state are visited at regular intervals throughout the year supplying them with such items as sheet metal smoke stacks, sewers, culverts and tanks of various kinds. Owing to difficulties of transportation most tanks are shipped by them "knock down" and fitted with flange joints and gaskets.

Because of the wide variety of possible work which a sheet metal and steel working shop can supply, this company has done some very interesting work. This "unusual" work covers a wide range of industries and kinds of fabrication. But, in Arizona at least all of this work



This interior of the Western Pipe and Steel Company plant shows a stack of the "stove pipe" well casings. These are formed of 10-gauge sheets and spot welded or riveted. The plant is equipped to handle any kind of heavy metal work

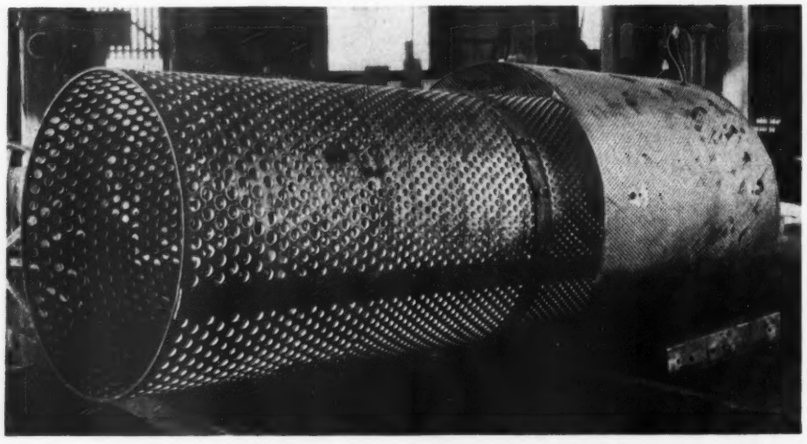
The oil industry of the Southwest is a heavy user of sheet metal. Here are oil tanks, buildings, and towers sheathed or made of sheet metal. These structures use very heavy gauge metal and the shop which can handle this kind of work finds many sales openings for its efforts

is classified under the heading of "sheet metal" working.

Both mines and irrigation projects use what is known as "stovepipe" well casings. These casings are sections of No. 10 gauge sheet rolled into a cylinder usually 3 feet long. The edges are flat lapped and spot riveted or welded. The sections ordinarily telescope about 18 inches for reinforcement of the joint between sections. The pipe sections are sunk in well drilling or laid like a pipe line in mine water removal systems. During 1930 alone the shop used some 34 carloads of sheet metal for this part of their business. Additional sales effort is now introducing these pipe sections to private owners for their pumping plants or wells.

One of the photographs show some of the "heavy" metal work done in the shop. These cylinders are used in sand and gravel plants for sizing sand and gravel. The material from the bank is introduced into the central cylinder and as the cylinders revolve the material is sized by passing through the holes in the sheets.

The inner sheet is punched from 7/16-inch plate, formed into a cylinder and the edges bolted together as shown. The outer cylinder is punched from a No. 10 sheet. Quite an extensive business has been worked up in these units.

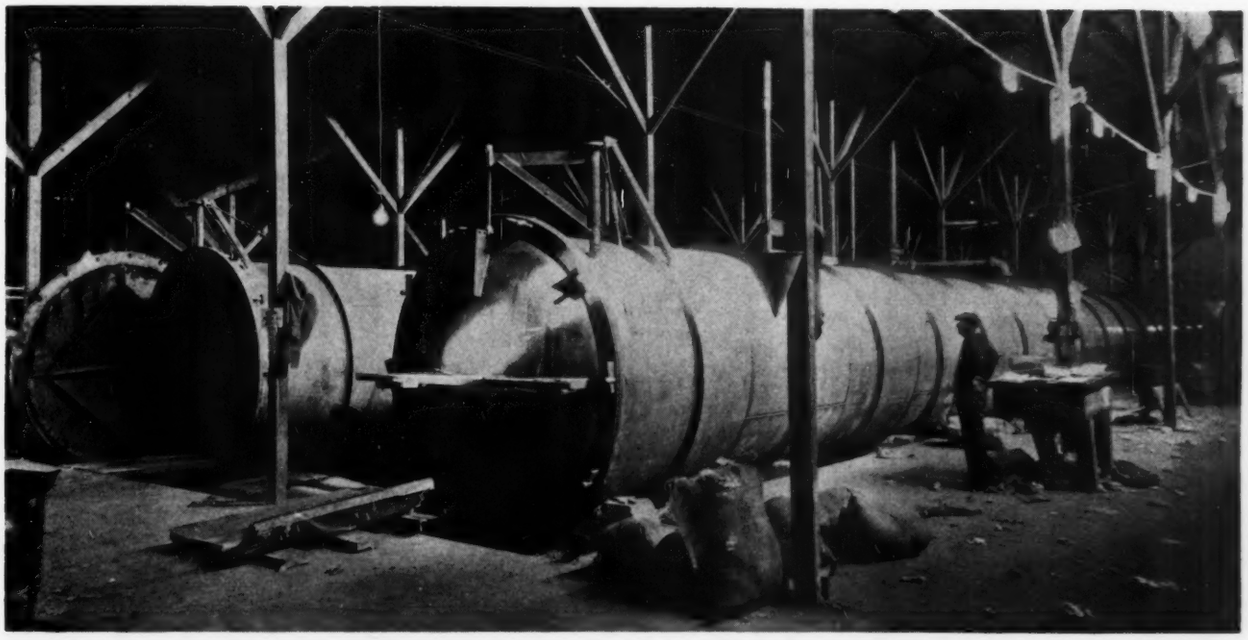


These are gravel plant screens. Materials are sized by passing through the holes as the screens revolve. The inner is of 7/16-inch plate

One of the interesting features of any Southwest landscape is the varied use made of sheet metal. The traveler through this part of the country is impressed with the number of sheet metal covered buildings and other uses of metal at practically all the railroad stops and sidings.

The oil industry has proved one of the largest users and for the oil people the Western company has designed and built numerous sheet metal units. The gasoline tanks shown in one of the pictures were built by the Western company. These tanks are of ¼-inch sheet electrically welded along all seams and laps. The picture is somewhat deceptive since the liquid which shows in the top of the tank is not oil, but a 6-inch water cap used to protect the oil contents from the high temperatures of the region. In order to hold this water out of the tank the top must be water-tight.

The buildings housing the pumps, offices, and equipment are in most cases built of sheet metal, either corrugated or flat. For this class of



These long cylinders are cotton fumigation tanks. Cotton is placed within, the gas is turned on, and the fumigation is complete. These units are built in sections and of heavy sheets. The sections are riveted and calked to be gas-tight. Each door is in itself quite a piece of design and workmanship

work the company fabricates much metal.

In the cotton industry, this sheet metal fabricating company has also done much work. A typical example of this heavy metal working is illustrated by the fumigating tanks shown in one of the photographs.

These tanks are air tight cylinders, built in sections and welded at the joints. The laps of the sections are also welded and the reinforcing bands are welded to the cylinder material. The ends of the cylinders are air tight doors, swung on the large hinges shown and wedged tight after the fumigator is filled.

These units are built usually 100 feet long and about 9 feet in diameter. They are formed up of ⅜-inch iron.

As the cotton comes from the field the bales are stacked in the cylinders and the doors wedged tight. Fumigating gas is then introduced and forced through all the interior. When the process is completed the cotton issues in condition to pass inspection.

The work of this company shows the extent to which a progressive sheet metal shop, supplied with equipment to do heavy metal working can work into a wide variety of industries. The Western company through aggressive sales policies has made its products and services of value to the entire state.

Ventilation Must Be Calculated in All Garage Heating

By **PLATTE OVERTON**
Consulting Engineer

Platte Overton

GARAGE heating is of secondary importance. It is of course understood that the rooms in which mechanics or attendants must work should be warm enough to afford comfort. In the display room where the salesmen work heating may be of more importance as the buyer must be comfortable and at ease if he or she is to be put in a receptive mood. However, from a humanitarian angle we are going to confine ourselves to the work shop and storage room where mechanics and attendants must spend the majority of their time while at work.

Here ventilation is of prime importance. When motors are running they exhaust a very dangerous gas known as carbon-monoxide (CO). Articles in the newspapers often remind us of the danger of carbon-monoxide (CO) when they tell of the death of persons who remained too long in a small confined garage with the motor running.

To those contemplating suicide there is no more sure, quick, and painless method of producing business for the undertaker than to remain in the average one car private garage with the doors closed and the motor running not to exceed five minutes.

However, there are persons who must obtain their livelihood in garages where this dangerous gas is predominate if the proper ventilation apparatus is not installed. A few years ago insurance statistics maintained that the average life of a garage mechanic was nine years. Out of this nine years three years were lost in time with headaches, and various ailments caused by this gas.

It must be remembered that this gas (CO) is not only dangerous, but that the effects derived from it last. When a mechanic goes home with a headache he may show up the next morning for work feeling better, but he has been incurably hurt. Old man "nine years" has taken his toll.

In many states and several cities

DATA SHEET

N 35 %
NW 35 % NE 30 %
W 30 % E 20 %
SW 20 % SE 10 %
S 5 %
Exposure Factors

Based on -10 °F. Cold Weather & Prevailing Winds From N.W.
Bldg. GARAGE Date
Archt.
Contractor H. & V. Engr.

Rooms No	1	2	3	4	TOTALS
Use	OFFICE	DISPLAY ROOM	STORAGE	WORK SHOP	
MEASUREMENTS					
1. Room Dimensions	19x18	28x18	48x60	18x48	
2. Cubic Feet Space	3420	5040	57600	12768	
3. Room Floor Area	342	504	2880	864	
4. Floor Const. & Factor	.10-4.0	.10-4.0	.31-10.64	.31-12.32	
5. Ceiling Const. & Factor	.24-5.2	.24-5.2	.31-2304	.24-10.24	
6. Window Const. & Factor	1.2-96	1.2-96	1.2-8932	1.2-95.30	
7. Wall Const. & Factor	.20-16	.20-16	.23-17.10	.23-18.26	
8. Exposed Sash and Door Perimeter, equiv.	19	43	208	104	
9. Leakage B. T. U. per ft. of Perimeter	100	100	100	100	
10. Expd. Wall Gross Area	370	460	1626	1740	
11. Expd. Window Gross Area	125.5	204	312	340	
12. Expd. Wall Net Area	244.5	256	1214	1380	
13. Exposure Direction	N.W.	S.W.	NW 35% NE 30% W 30% SW 20% SE 10% S 5%		
14. Room Temperature & Mean Temperature	70°-70°	70°-70°	55°-64.35°	66°-69.92	
HEAT LOSSES					
15. Wall Loss B. T. U. per Hr.	3212	4096	20759	25138	
16. Window Loss B. T. U. per Hr.	12048	19584	59308	34307	
17. Subtotal Loss B. T. U. per Hr.	15260	23680	80067	59505	
18 Expos. Allow. B. T. U. per Hr.	5580	4736	16013	11901	
19 Floor Loss B. T. U. per Hr.	1080	1440	12120	8065	
20 Ceiling Loss B. T. U. per Hr.			71884	9358	
21 Leakage Loss B. T. U. per Hr.	1900	4300	20800	10400	
22. Total Heat Loss	24520	34156	200884	99209	
23. Deduct for Heater Size	950	2150	10900	5200	
24. Heater Building-Loss Load	23570	32006	189984	94009	339569
SERVICE					
25. Air Supply C. F. M.	800	1120	4200	2664	8784
26. Recirculation C. F. M					
27. Air Supply Inlet Temp.	100°	100°	100°	100°	
28. Air Supply B. T. U. Service					

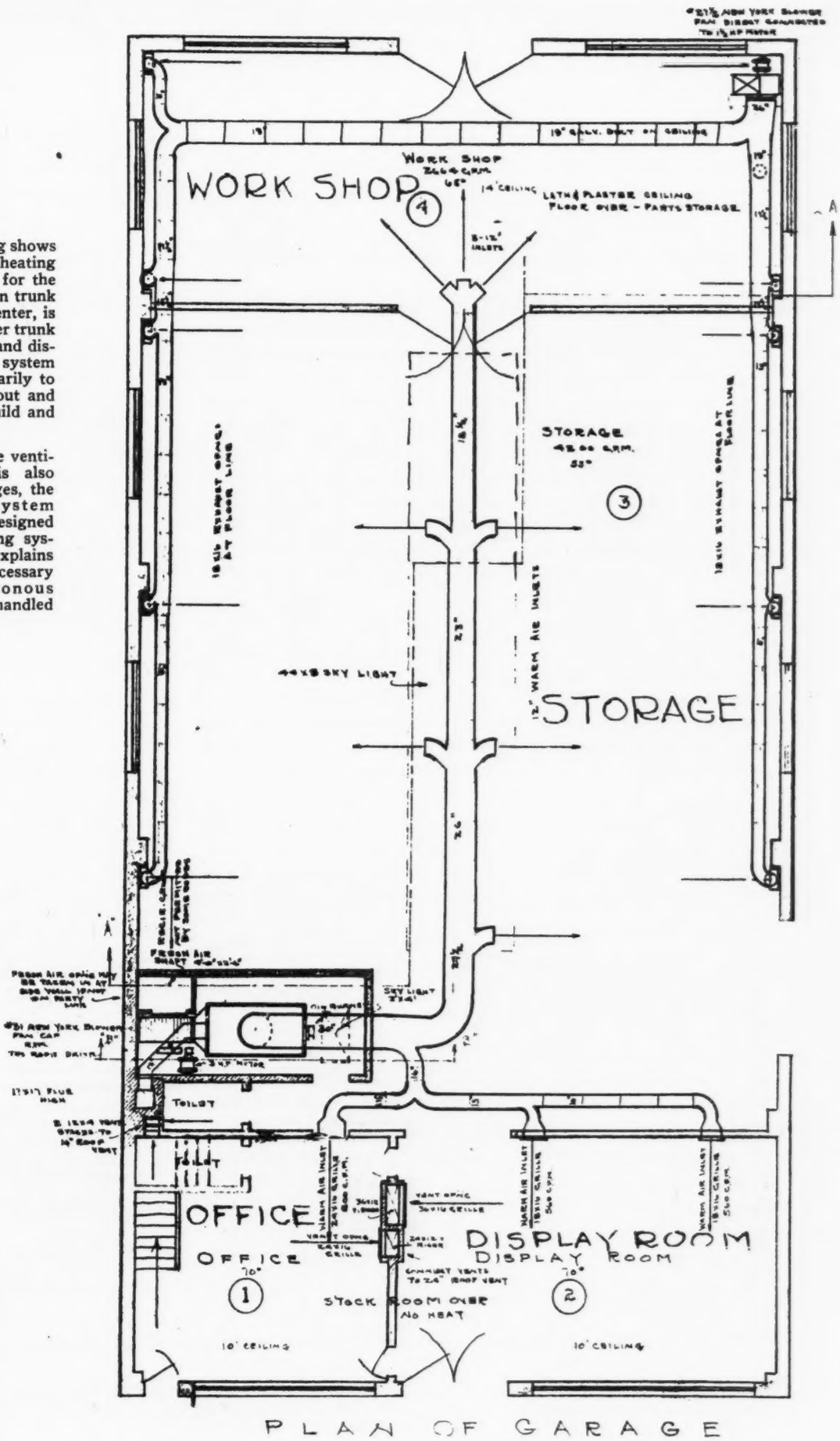
ADDITIONAL HEATER LOADS	
29 Outside Air Heat Loss, up to room temperature	110,000
30 Recirc. Air Heat Loss, up to room temperature	
31. Humidity Service	155,000
32 Total of Items 24	339,569
33 Total Heater Load	1,204,509
34. Chimney Size Required	16x16 - 25'-0" HIGH

* Plus 35% for Sky Light

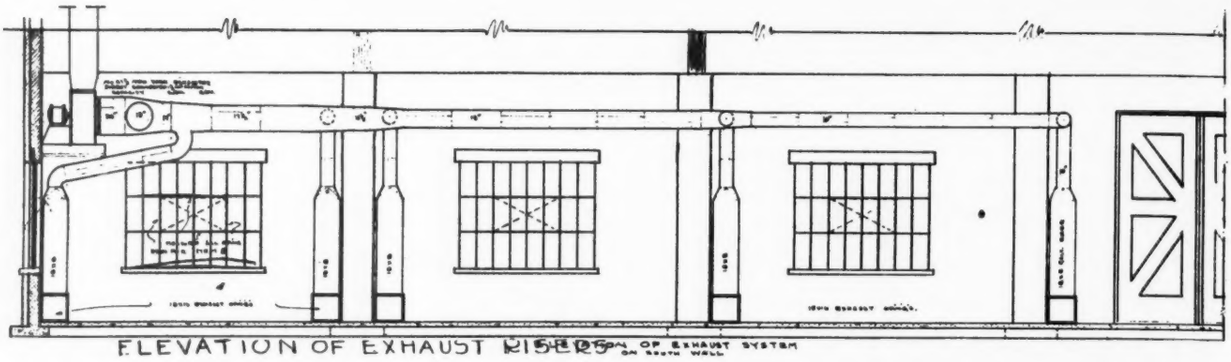
This is the data sheet for the job under discussion. If you don't remember how each of the items is calculated, refer back to your October 11 AMERICAN ARTISAN, where you will find complete information

This plan drawing shows the layout of the heating system designed for the garage. One main trunk line, down the center, is used. One smaller trunk heats the offices and display room. The system is designed primarily to be simple in layout and economical to build and erect

The layout of the ventilating system is also shown. In garages, the ventilation system should be so designed before the heating system. The text explains why this is necessary and how poisonous gases should be handled



PLAN OF GARAGE



Here is the side elevation of the ventilating system. Note that the intake registers are located at floor level, though the duct is carried along the ceiling line. The fan exhausts through the roof

the authorities have seen fit to adopt ventilation codes requiring the proper ventilation of garages. The plan here shown is for a garage in Wisconsin where the ventilation requirements for garages is no doubt the most stringent now in force.

In Wisconsin the work shops must be supplied with 3 cubic foot of air per minute for every square foot of floor area. The office and display room are supplied with air enough to successfully heat them to 70 degrees unless the office force is large and the space confined. In this case they must be supplied with 2 cubic foot per minute for each square foot of floor area.

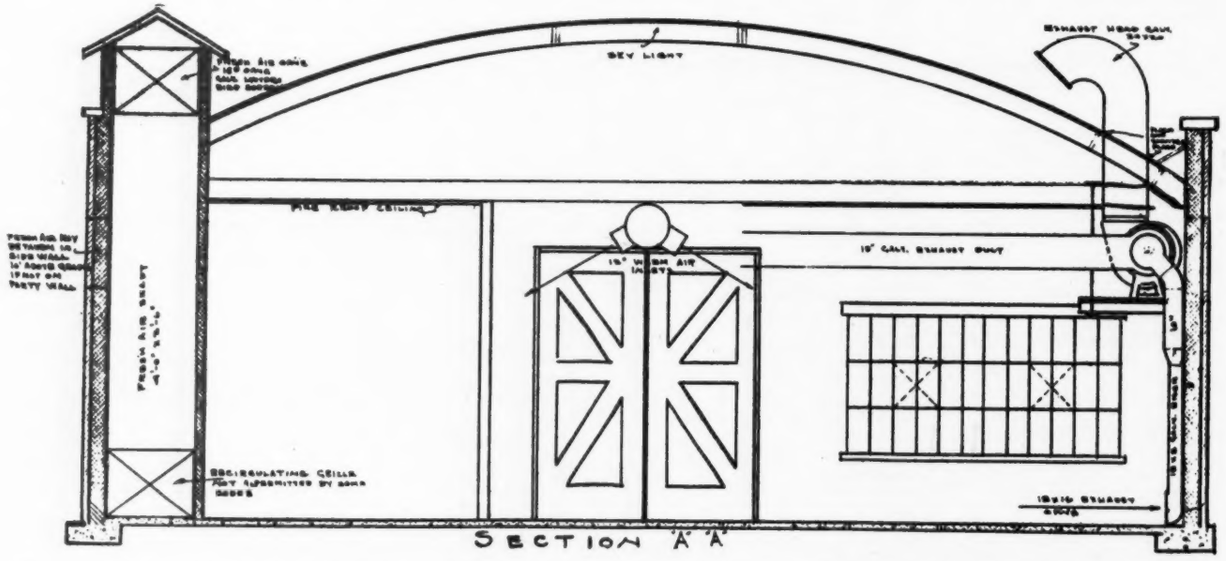
In the plan shown—all outside air is required, no air recirculated. This means that a large heater must be installed and more fuel will be used than if recirculation were permitted, but we have a dangerous condition to handle and the fuel bill is of secondary importance.

On the plan shown the entire building is heated from one large main duct, hence the warm air at all the outlets is or must be the same temperature.

We supply air from the outside, hence we must exhaust at least as much air as we supply. The exhaust is mechanical and positive. It will function regardless of temperature, wind, direction, or season of the year. Gravity exhaust systems in garages are practically impossible. The exhaust risers must be placed on outside walls where they tend to chill and cause downdrafts. These downdrafts occur even in the face of a pressure set up by the supply fan. Roof ventilators would simply exhaust the heat from the building and leave the floors and breathing line cold. CO gas is heavy and when cooled will lay close to the floor, hence we must exhaust at the floor line. This will remove the gas and pull the heat down where it is needed.

The office and display room are mechanically heated but have gravity exhausts. Here the vent risers are on inside walls and will function as they are warmed by the building. The toilet rooms exhausts are placed against the smoke flue to keep them heated and working.

In a previous article the writer pointed out that inlet temperatures were based on 120 degrees, and that one c.f.m. (cubic feet per min.) was based on the B.t.u. loss divided by the factor 48.96 for rooms with 70 degrees at the breathing line. In this garage we have four rooms



Looking at the end of the building, we see the heating trunk down the center and the ventilating lines down the sides. The fresh air intake tower is at the left. No recirculation of air can be made, as in garage heating fresh air has to be heated and used air blown out

where in at least two of them the c.f.m. is fixed by state law. We have but one main duct where the temperature will be the same. In this case we must heat all rooms to the required temperature with the one temperature of air in the main.

Where the c.f.m. is given we determine the inlet temperature from the formula

$$t_1 = \frac{\text{B.t.u. Loss}}{\text{c.f.m.} \times 1.07} + t_2$$

where

t_1 = inlet temperature

t_2 = room temperature to be maintained

and in this case for the workshops where we are supplying 2664 c.f.m. our inlet temperature is 100 degrees. This 100 degrees must therefore be the inlet temperature of all the rooms. Our problem is to determine the c.f.m. at 100 degrees required to heat the office and display rooms where the requirements are not covered by state laws.

Our factor 48.96 is derived from the equation

$0.24 \times (t_1 - t_2) \times 60 \times 0.068$

where

.24 = specific heat of air

t_1 = temperature of air at grille

t_2 = temperature of room

0.068 = weight one cubic foot of air at 120°

Here it is obvious that our 0.068 must be changed to air at 100 or 0.070 as one cubic foot of air at 100 degrees weighs 0.070 pounds. And our factor would be

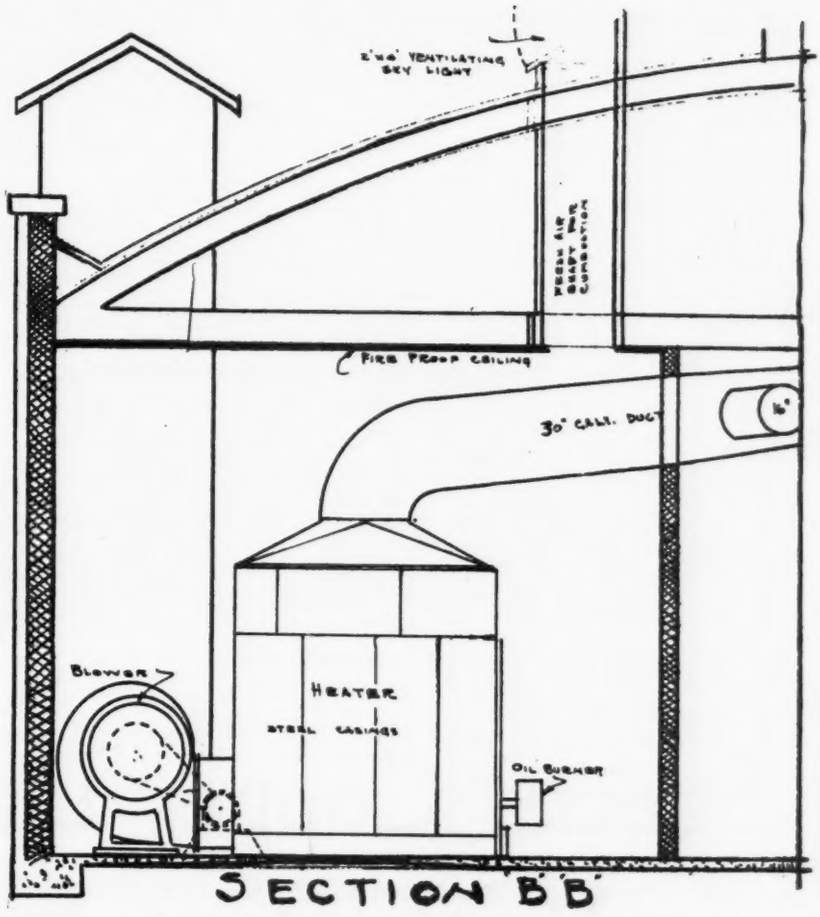
$0.24 \times (100 - 70) \times 60 \times 0.070$

equals 30.24.

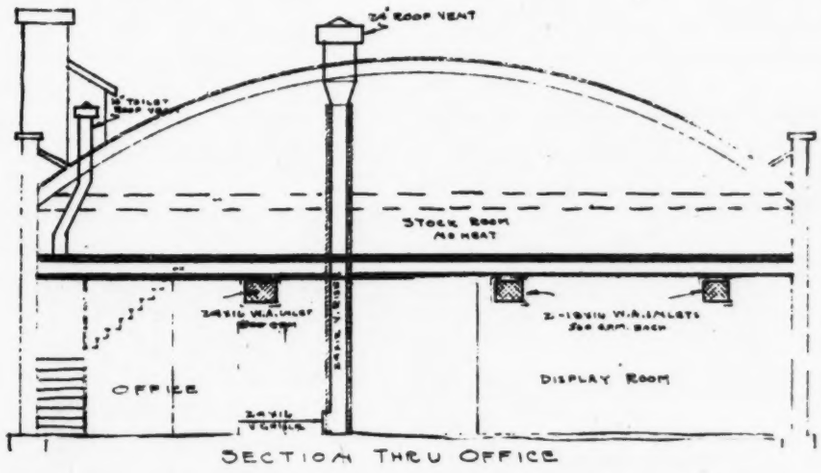
We divide our B.t.u. loss for the office and display room by this factor for our c.f.m.

If we supply the workshops with 2664 c.f.m. at 100 degrees it is also necessary for us to know what our exhaust air will be as we will base our exhaust fan on this volume. We assume the air in the workshops at the floor line to be 60 degrees. One cubic foot of air at 100 degrees weighs 0.070. One cubic foot at 60 degrees weighs 0.076. 0.070 divided by 0.076 equals .92 or 92% of the air supplied in the shop must be exhausted 2664 times .92 equals 2450 c.f.m. It will be noted that in relatively small volumes of air the difference is not great but if we were estimating jobs that required say 100,000 c.f.m. the difference would mean a great deal. A size smaller fan might be used for the exhaust

These various volumes are pointed out to the reader with the view of familiarizing the warm air heating man with the temperatures of air and the density (weight) at the various temperatures.



A detail of the heating plant. The warm air blower is hooked into the intake chimney, but the heater room is supplied through a separate ventilator in the ceiling



The offices are heated through registers placed in the wall at ceiling level. These rooms are also vented through a separate ventilator running from floor level through the roof

Hass Sheet Metal Works does a lot of ventilation work. Here are two large gravity ventilators waiting to go to a job

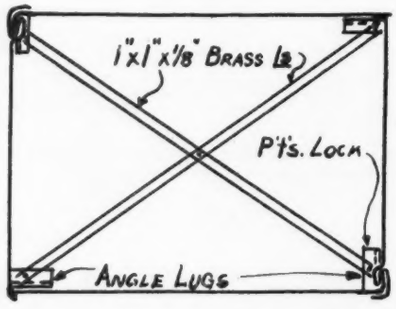
Special Copper Ducts Used in Ventilating System of Madison Square Garden

THERE can't be many of our readers who haven't heard about Madison Square Garden in New York City. Probably a large percentage of readers have sat in the old or new garden watching some of the sports events staged there.

When the new garden was built an oversight was responsible for the lack of sufficient ventilation in the dressing rooms. This error was soon realized and steps taken to remedy conditions. In constructing the new ventilating system, the Hass Sheet Metal Works of Brooklyn was the successful bidder on the alteration work.

The interesting feature of the reconstruction is the use of 24-ounce copper for the ducts. Another feature is the concealing of the work between the old and a new false ceiling just below the ducts. As now reconstructed the ducts are between a new and the old ceilings.

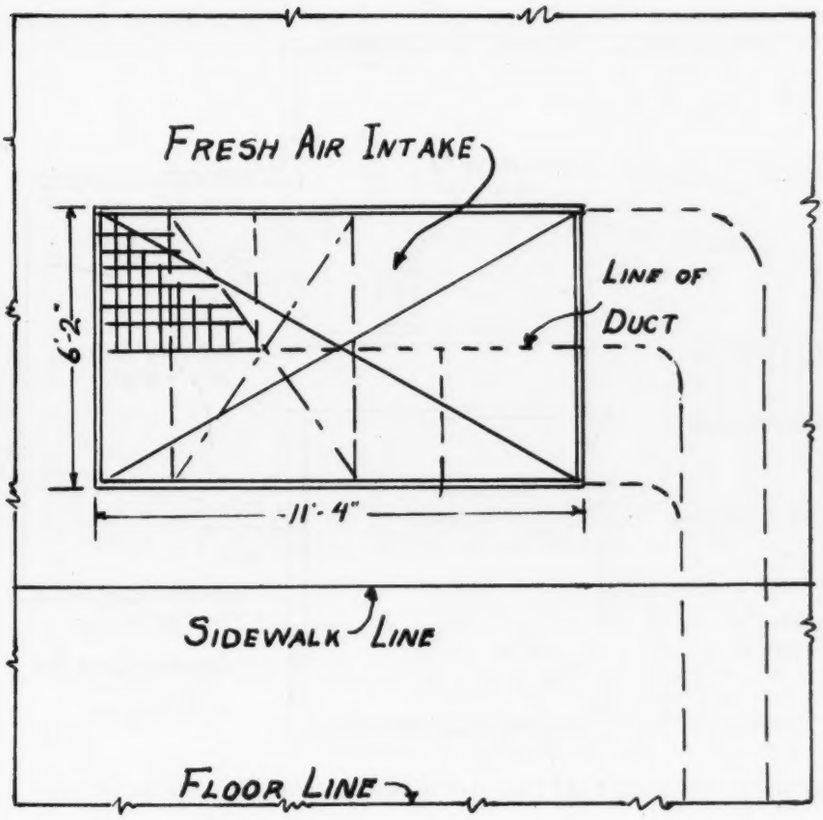
The ventilation system for the dressing room is connected into the large system for the whole garden.



The copper ducts were braced diagonally on the inside with brass angles and brass lugs. Two Pittsburgh locks were used. Additional bracing was used on the outside at the seams

The garden is a large open building without columns on the floor, with the roof supported across the arena by trusses. The balcony is hung cantilever out from the walls. Just above the top row of seats grilles for taking air out of the arena are cut through the wall faces. These grilles connect to ducts which are embedded in the outside walls. These wall ducts run from the line of the bottom chord of the roof trusses down through the walls to the basement floor line. Here all the ducts are connected into a fan system located in each corner and the used air is blown out into the street beside the building.

The dressing rooms are located in the corner of the building. The old ceiling of the dressing room was hung on the main floor joists. To



The fresh air intakes are large grilles in the outside wall just above sidewalk level. Ducts carry the air down to basement floor level and then up to the registers. The ducts of the system are enclosed within the exterior walls of the building in the form of flues

ventilate the rooms, then, ducts were placed between the old ceiling and the new one and opened into the dressing rooms through the ceiling. The air coming out of the dressing rooms is then carried through the ducts into the old flue in the wall and so out to the street.

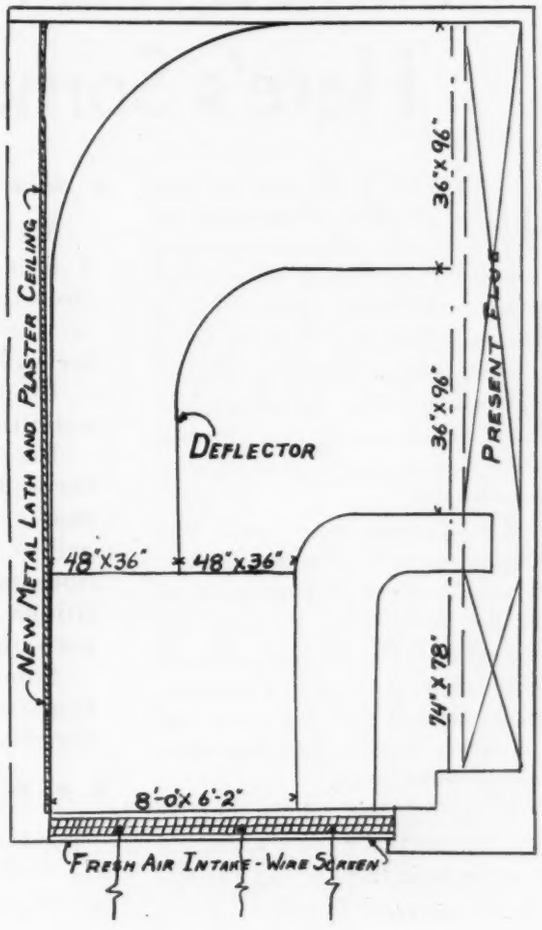
The construction of the ducts is shown on the accompanying sketches. All the ducts are of large size and had to be well reinforced to provide stiffness. In order to get this required stiffness the contractor braced the inside of the ducts with brass angles running diagonally across the inside. These angles were riveted to angle lugs in the corner of the duct. The ducts were formed up in lengths of from 5 to 6 feet, depending upon the location of the duct. At each section joint an outside stiffener of brass angle was riveted completely around the duct. This construction not only braced the joint, but also made the duct line extremely stiff.

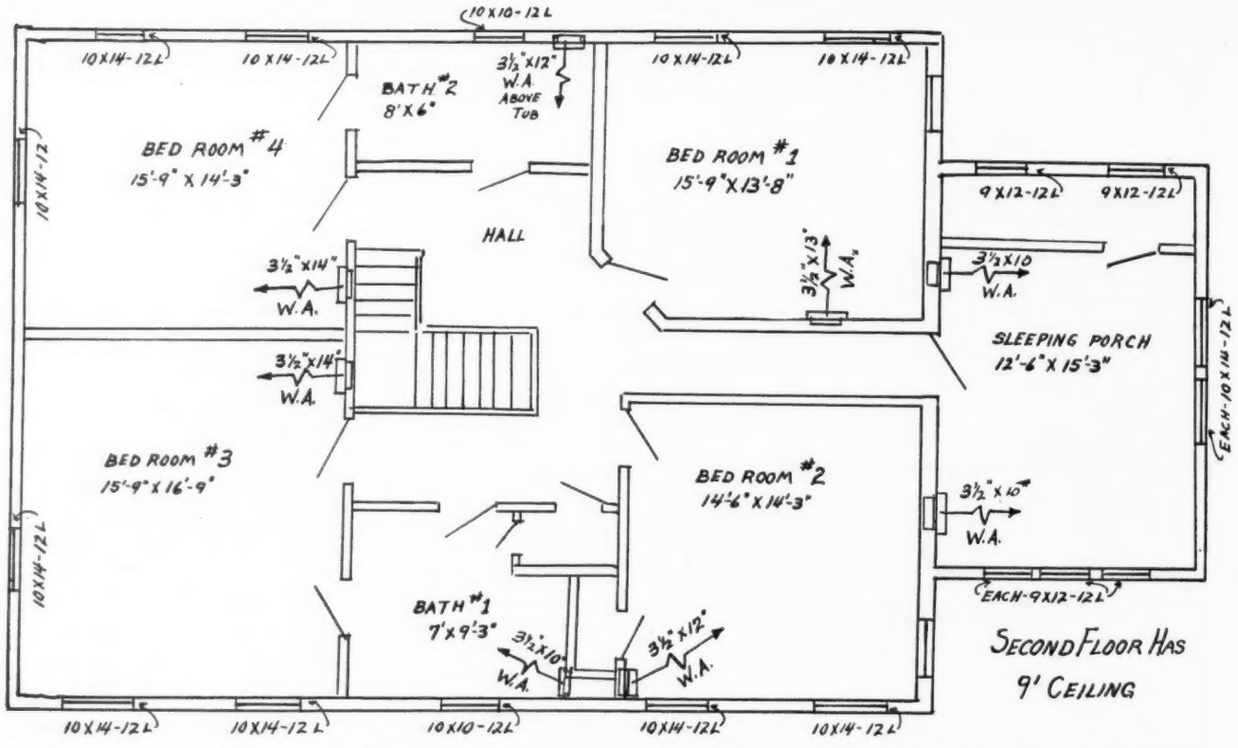
The contractor designed his ducts to be formed out of two pieces of copper sheeting. Each half ends in one part of a Pittsburgh lock so that there is a Pittsburgh lock down two of the seams. The other corners are rounded with a very short radius.

A feature of the work was the soldering of all seams and laps. Each corner lock is soldered and the cross laps are soldered tight.

The reason for this elaborate protection is that the owners wanted the system to be erected and then forgotten and in order to insure this permanence of construction went to the expense of using copper for the ducts and the very best of workmanship throughout the job.

The ducts between the outside grilles and the wall flues are of large size. The largest duct is divided by a copper deflector soldered top and bottom. These ducts only run through the dressing rooms. They connect into the wall flues and become a part of the present ventilating system





Here is the second floor where the trouble lies. Bedrooms 1 and 2 are slow to heat up unless the doors are left open

Remember That Troubleshooter Problem? Here's Some More Solutions

IN the October 11 issue we published an article telling about the trouble one well-known heating contractor was having with a large house. The house doesn't heat as the owner and the contractor feel it should. We explained the troubles and asked readers to tell us how they would remedy the situation were they called in and asked what was wrong.

The principal things wrong with the systems are—bedrooms numbers 1 and 2 and the sleeping porch, all on the second floor, are very slow to heat up in the morning, especially if the doors are closed. Then if the doors are left open the rooms will get much warmer than any other rooms in the house.

In giving their solutions to the trouble, practically every writer said that the main thing wrong was that *the rooms are air bound.*

We are delighted to find a uniformity in the solutions to this problem. Here is what our readers—collectively—would do:

Eliminate the air bound condition.

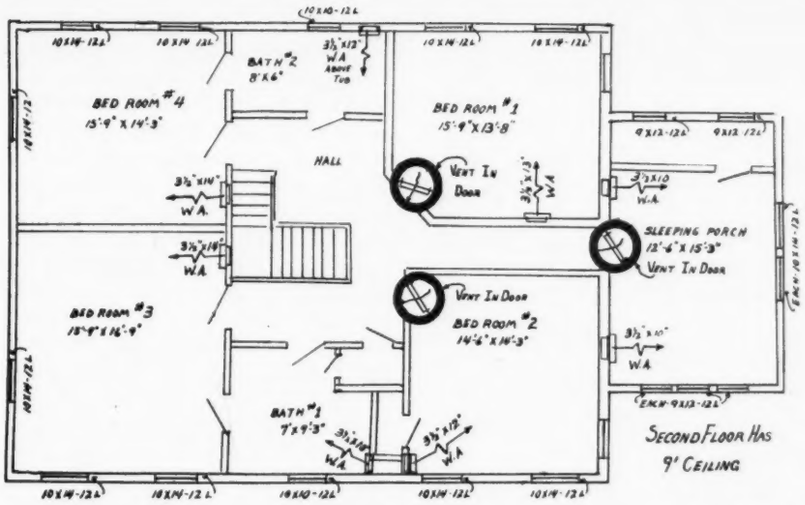
Provide exit for the air through attic ventilators, stacks to the air return grilles of the first floor, openings through the partitions to the hall, or return air grilles in the hall.

Some additional solutions will be published in the next issue.

The first of the suggested solutions were published in the November 22 issue. In addition to the explanations we showed by illustrations what changes the writers would make.

Now we are going to publish a second batch of suggested changes. These, like the first, agree nicely, and the changes correspond closely with those published before. Here they are—

One of our readers, B. L. Schwartz of Pittsburgh, who has some splendid heating installations to his credit, sends us an answer which not only takes up the problem directly but also points out some facts about forced air heating which frequently are overlooked by both the contractor and the engineer. In addition to giving us a practical solution to the difficulty, Mr. Schwartz also gives the owner a pointer or two which might well be tried out to prove the contention that the rooms are air bound, and which



B. L. Schwartz's recommendations are simple in the extreme. Grilles to let air into the hall are the basis for the changes

might overcome the trouble without altering any of the present system.

Mr. Schwartz says:

It is apparently agreed that the owner does not want his present system all torn up. You also state that no layout is shown for the basement duct system, in order that the proposed corrections to take care of the complaint be not influenced by any existing duct work.

The above situation leads us to a comparable case wherein a doctor is called upon to diagnose a situation and the patient refuses to describe symptoms or answer questions. In other words, we do not think any material benefit can be obtained by laying out a detailed duct system to take care of the heating layout which this calls for, and expect to arrive at the solution of the trouble.

From our point of view the calculation for heat loss requirements for two bedrooms and sleeping porch in question is a very simple matter and undoubtedly has been figured correctly in the original layout. The fact that the rooms are very slow to heat up in the morning, and then later in the day when the doors opening from the sleeping porch into the hall and from the two bedrooms leading into the hall are left open, the three rooms become warmer than the rest of the house, indicates that the circulation has been interrupted by having the doors closed during the night.

It is quite apparent, then, that with the bedroom windows normally open at night, the warm air pipes fill up with cold air and the pressure of the fan to these long runs is insufficient to immediately remove this column of cold air, resulting in slow heating results.

From our point of view, two simple remedies could be tried, with probable improvement in the elimination of the undesirable conditions:

A. Adjust the dampers serving the other rooms so as to increase the amount of air pressure available for the three rooms in question.

B. Install vents in the bottom of the doors leading from these rooms, so that there will be a continual circulation of air from these rooms, even if the doors be closed.

There is also another possible correction which may be used to advantage; namely, to have the occupants of these rooms close the warm air registers before retiring at night, in order to prevent the risers from filling up with cold air after the windows are opened and the rooms become chilled.

I appreciate the fact that the above suggestions do not include any recommended changes in duct capacities or sizes, and that therefore this analysis may be somewhat disappointing. On the other hand, I feel that a certain amount of good can be accomplished if our suggestions be followed out.

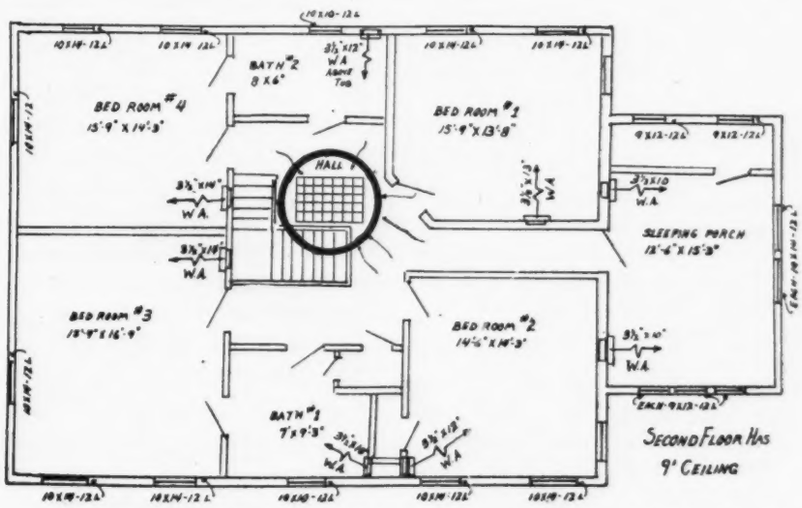
W. A. McGraw, St. Louis

Here is a reply which is short, but to the point. The solution agrees with the others, but is a simpler system and requires less material and labor. This solution is submitted by W. A. McGraw of St. Louis, Missouri. A sketch is shown. Mr. McGraw says:

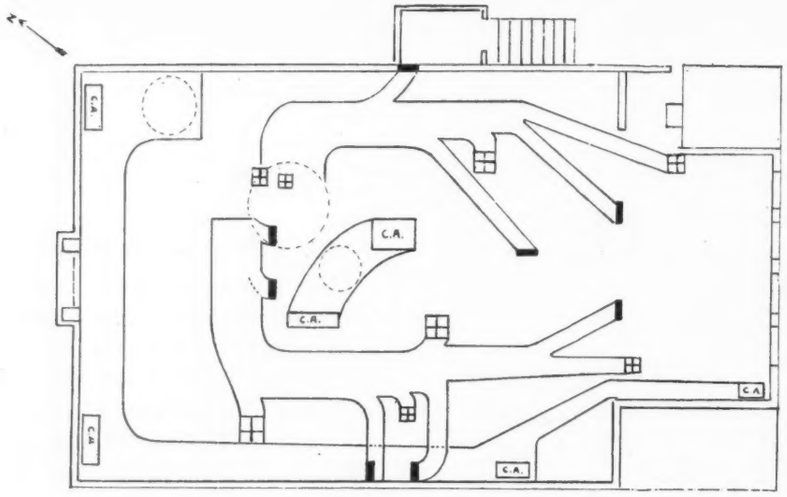
Reference to your October 11 issue, page 44, "Troubleshooters, Attention!" I am sending enclosed for your attention my layout for this heating job as I see it. I am omitting sizes for the reason this job is installed and satisfactory with the exceptions of Nos. 1 and 2 bedrooms, also sleeping porch.

I would suggest another C. A. return from point indicated on plan, from second floor, to take care of this, and not forget to grille the lower porch of the door leading to sleeping porch.

In addition to the suggested return air to be placed in the hall, Mr. McGraw also submits a layout for the duct system in the basement. No layout was shown on the original problem, but we asked readers to show what sort of a duct system they would use with a house of this kind. As stated in the letter, no dimensions are shown on the



W. A. McGraw would place one large return air grille in the floor of the upstairs hall to connect into a vertical stack to the furnace



This is W. A. McGraw's layout for the ducts in the basement. Two large warm air lines and three return air runs form the layout. The suggested system is compact and nicely placed

ducts, the idea Mr. McGraw has in mind being to show how he would lay out the ducts to connect into the registers and return air lines.

P. R. Cotton, New Orleans

Down in New Orleans P. H. Cotton operates a heating and sheet metal shop which does a wide variety of work. Heating, ventilating, blowpiping and specialties are included in his field of operation.

Mr. Cotton says that the problem interested him, since he has for years made it a point to be as good a troubleshooter as possible. His analysis of the bugs in the system agrees with the others. He says the main trouble is that the rooms are air bound and that placing an exit for the cooling air will overcome the difficulty. His solution is shown is one of the accompanying drawings. His letter says:

If I could look this system over in person and see the construction of the various pipes and fittings as well as the workmanship, I think I could make the system work satisfactorily. In the event I failed to do so, I would not expect a cent for my efforts.

After looking at the drawings as shown and reading the description of your bugs, here are a few suggestions that I think will benefit the system.

I suggest placing registers in bath No. 2, bath No. 1, bedroom No. 2, second floor, in the inside walls of said rooms, if the owner will stand the expense. However, this change is not absolutely necessary.

In regard to slow heating of bedrooms Nos. 1 and 2, on the second floor, place a ceiling register, 12x12 inches, in the ceiling of each room. This will create a circulation of air in these rooms and will make them heat up very rapidly. The slow heating of these rooms at present is due to the rooms being air-tight. This, of course, causes a poor circulation of air.

If the owner and contractor are opposed to the ceiling registers, all that is necessary is to lower the windows at the top, about four to six inches. This will cause a circulation of air in the rooms.

I am passing along this information from my experience with various systems I have had trouble with due to rooms not heating.

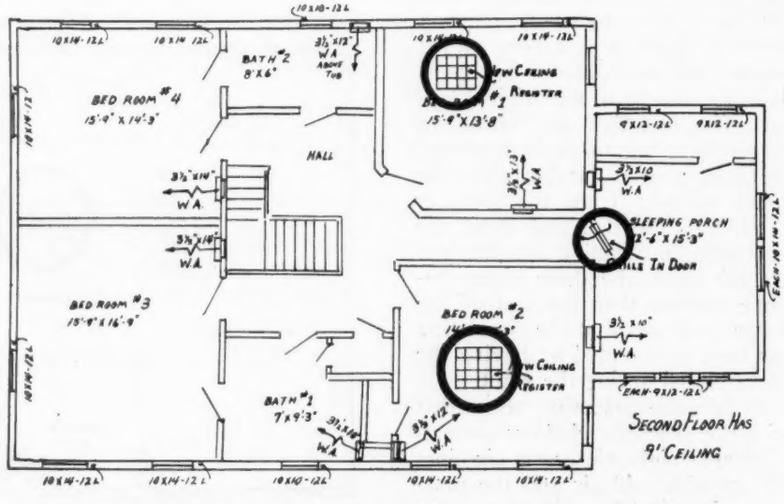
I have shot trouble on various heating, ventilating and blowpipe jobs and have seen 60- and 70-inch dust collecting systems that refused to function because the rooms were air-tight. This caused a vacuum. All that is necessary is to give the rooms air and the system worked like a charm. I think this is mostly the trouble with the bugs in the warm air heating system outlined in the October 11, 1930, issue of your valued trade journal.

Dewitte Van Evera, Chicago

Here is another very interesting solution which comes from one of the real old-timers of the heating business—Dewitte Van Evera of Chicago. Mr. Van Evera was doing trouble-shooter work before most of the heating men now active were born. He recalls overhead duct systems and controversies about the amount of cold air versus warm air forty years ago.

His suggested change is based on the fact that cold air from the outside when introduced into the casing of a furnace has much the same effect on the flow of air through the casing as has the introduction of a small fan. In other words, it accelerates the flow of air.

Mr. Van Evera's solution involves installing two new return air ducts

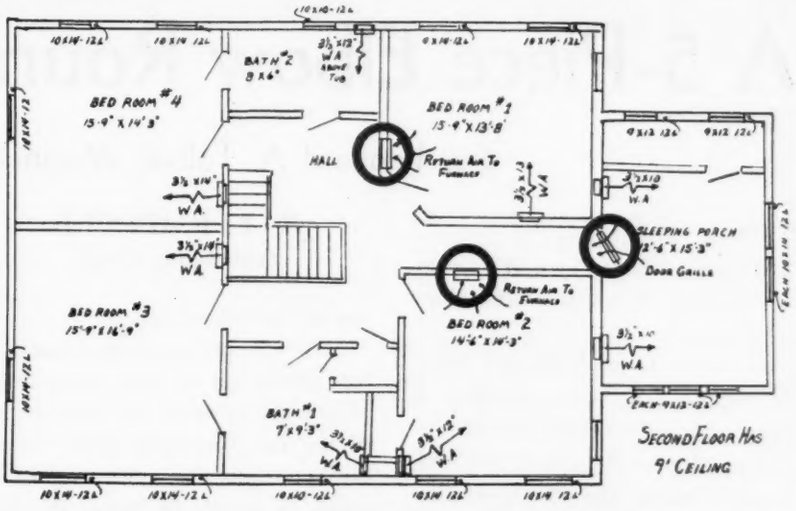


P. H. Cotton says that the cheapest method would be to place ceiling registers in the bedrooms and let the air exhaust into the attic space. This would relieve the pressure and allow the rooms to heat

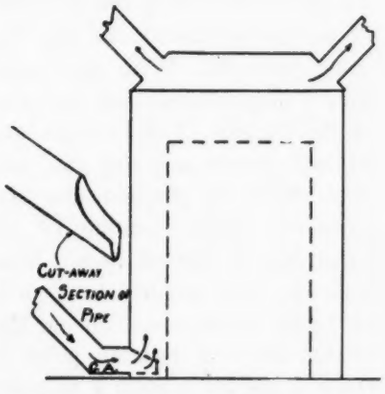
through partitions and also a grille in the door of the sleeping porch. A layout showing his suggestions has been made and accompanies this letter. Mr. Van Evera says:

In order to overcome the trouble I would place a long, narrow register, having not less than 63 square inches of free area, in the baseboard of the partition between the bedrooms and the hall. I would also place a long, narrow register, having at least 112 square inches of free area, in the bottom of the door leading from the hall into the sleeping porch.

I would advise the owner to close the registers in any or all of the three rooms whenever an outside window is opened.



Dewitte Van Evera lowers the pressure through baseboard grilles through the partitions into the hall. He would also give the furnace additional cold air from the outside



Here is how the outside cold air is introduced into the casing. It should be by an individual run of pipe. The cutaway section shows how the pipe is cut to permit the air to flow smoothly upward in the casing

All three of the new registers would, of course, open into the second floor hall. The natural movement of the air from here would be down the stairs and to the return air grilles of the first floor. Whether the "pull" is strong enough, I can't tell.

I would also suggest that the owner make provision for the introduction of additional cold air into the casing. I do not mean return air from the house, but air from the outside. This air would be heavier than the air within the rooms, and if it were introduced down at the bottom of the casing would act like a small fan to increase the flow of air up through the casing. This would increase the pressure of the air entering the upstairs rooms.

There should be at least 154 square inches of outside air put into this furnace. The ducts should get the air from the north side of the house, if possible, and if not, then from the west side. The important thing to remember is that this should be a separate and distinct system and should not be connected into any of the existing return air ducts or pipes.

Just how Mr. Van Evera would take care of this cold air is shown in one of the drawings.

Are You Reading Overton's Articles?

In publishing these articles by Platte Overton we want to give you contractors who are interested in the technical engineering problems of heating something to think about and apply to your everyday work.

These articles are not first grader stuff. They are packed full of engineering data that would take you months of research to dig out. The whole idea behind the series is to make engineering as simplified as possible.

Platte Overton and the *American Artisan* want to put out these articles in such form as will make them understandable to every reader.

If you can't understand some point write Overton care of *American Artisan*. He'll be glad to answer your question. If you like this sort of article let us know us know about it. We can't tell what's good and what's bad unless you readers co-operate with us.

A 5-Piece Elbow Round to Oblong

For Leonard A. Talbot, Marinette, Wis.

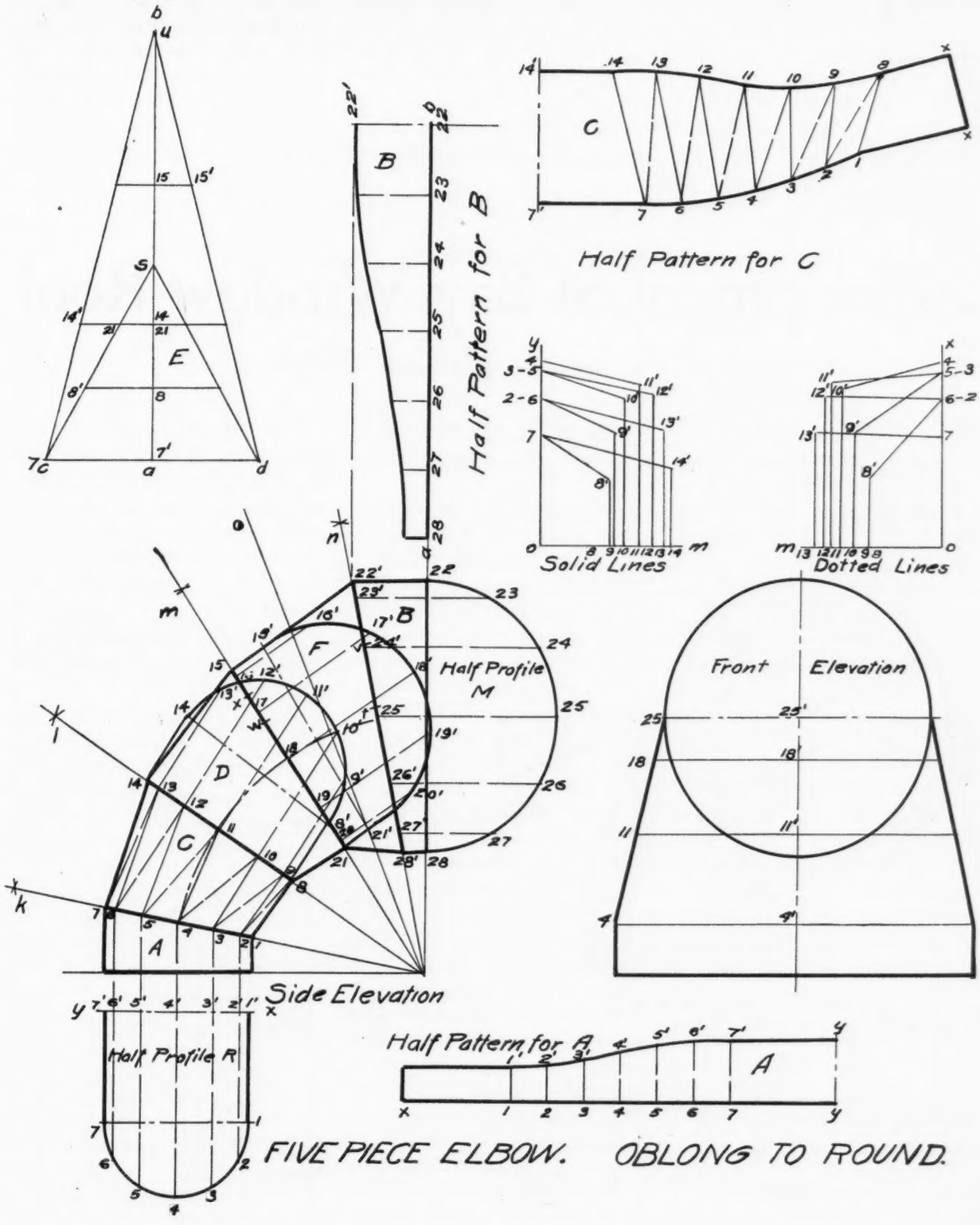
By **L. F. HYATT**
Contributing Editor

THE accompanying problem was submitted by a Wisconsin reader. It is a problem seldom encountered.

To begin the problem first draw the angle A-B-C. Then with B as a center draw the center line JK as shown. Extend the center line and draw the round and oblong profiles the desired size. Divide these profiles into parts and number as shown. To obtain the miter lines between the five sections of the elbow, first divide the angle A-B-C on the center line into one less than the number of pieces in the elbow. Draw very light lines through these points as shown by the line B-o. Next bisect the angles made by these lines and draw the miter lines through these points k, l, m, and n. Draw horizontal lines from each of the divisions on profile M to the miter line B-n; also draw lines from the half profile of the oblong end to the miter line B-K. Next it is necessary to determine the taper from miter line to miter line as the size of the pipe decreases from the round to the oblong end. First take the distance from 1 to 7 on the miter line k, and step it off from *s* on miter line B-n locating point t. Bisect the distance t to u, locating v. Now take half the distance from s to v and with the intersection of the miter line and center line (point 18) as a center, draw arcs intersecting the miter line locating points 15 and 21. Draw lines connecting s and 21, then u and 15. Next take the distance 1 to 7 again and step it off on the miter line B-m from point 21 locating point w. Bisect the remaining distance w to 15 locating point x. Now talk half the distance from 21 to x and with 11 as a center as before draw arcs intersecting the miter line locating 8 and 14. Connect the points 15-14-7 and 21-8-1, thus completing the outline of the side elevation.

Now it is necessary to obtain the half profile on the two miter lines before determining the true length of the fore-shortened lines. Draw the horizontal line c-d on figure E equal in length to twice the distance from x to 1 on the half profile R. Half way between these two points erect a perpendicular line of indefinite length, and on this line step off the distances 7 to 14, 14 to 15, 15 to u found on the side elevation. These distances are of course the true lengths of the center lines of the flat surfaces found on the back of the elbow. Next take the distances 1 to 8, 8 to 21, 21 to s found on the side elevation and step these distances off on the vertical line a-b as before. Draw horizontal lines through each of these points as shown in E. Then draw the lines from c and d to point u and from c and d to s. This figure gives the flat surfaces of the throat and back of the elbow.

Now at right angles to the miter line 8-14 draw lines of indefinite length from each point on the line. Then with the instruments set from 14 to 14′ on E, step off the distance 14 to 14′ on the half profile. This is half the width of the flat surface on the back. Now take the distance 8 to 8′ on E and step it off on 8 to 8′ on the same half profile. Now from the front elevation take the distance 11 to 11′ and with 11 on miter line B-l as a center strike an arc intersecting the line just drawn at right angles to point 11 on miter line B-l, locating 11′ on the half profile. Now draw the half circle and divide it into equal parts. Draw lines parallel with 11 to 11′ from each of the numbers 13′, 12′, 11′, 10′ and 9′ to the miter line, and number these points 8-9-10-11-12-13-14. Connect these points by drawing lines as shown by drawing lines from 7 to 13, 13 to 6, 6 to 12, etc., on part C of the side elevation. We may now determine the true length of the lines on part C. Construct two right angles one for the dotted lines and the other for the solid lines as shown. Begin with the distance 7-13 on part C which is a dotted line. Step this distance off on the horizontal line o-m locating point 13. From this point draw a perpendicular line and step off the distance 13 to 13′ found on the half profile and step this distance off on the perpendicular line previously drawn, locating 13′ on the group of dotted lines. Now from the half profile take y to 7 and step this distance off on the vertical line o-x locating point 7. Draw a line from point 7 to point 13′ thus obtaining the true length of the line 7 to 13 found on the side elevation. Now take the distance 13 to 6. Step this distance off on the line o-m of the solid group of lines, locating point 13. Draw a vertical line from this point and step off the distance 13-13′ found on the half profile on the vertical line just drawn, locating 13′. Now from the half profile R take the distance 6-6′ and step it off on the vertical line o-y, locating point 6. Connect these two points thus obtaining the true length of the line 13 to 6 found on the side elevation. Continue with the other lines of this part of the elbow exercising care to use the distances on the two half profiles in the correct order. Complete the pattern for A and B by using the parallel line method as shown, by drawing the stretchout line a-b and upon this line stepping off the distances 22-23, 23-24, etc., found on half profile M. Draw horizontal lines at right angles to the line a-b from each of the points.



Then draw lines parallel to the stretchout line from the points 22', 23', 24', etc., found on the miter line, and draw the curved line of the pattern through the points of intersection, thus completing this pattern. The pattern for A is made in the same way. To conserve space we have placed the pattern out of correct position.

We are now ready to complete the pattern for C. Begin the half pattern for C by first constructing the part which represents half of the flat surface on the back of the elbow found on E, 7-7', 14-14'. The 14 to 7 on this first part of the pattern is of course the same length as the 14'-7 found on solid group of true length lines. Next take the distance 7 to 13' found on the dotted group of true length lines, and with 7 as a center strike an arc of indefinite length. Now from the

half profile take the distance 14′ to 13′ and with 14 on the pattern as a center strike an arc intersecting the arc previously drawn locating point 13 on the pattern. Continue by using the distance 13 to 6 from the solid group of lines, and with 13 on pattern C as a center strike an arc. Next from pattern A take the distance 7′-6′ and with this distance and 7 on pattern C as a center strike an arc intersecting the arc just drawn locating point 6. Continue with the other lines of the solid and dotted group up to and including the line 8-1. Then construct half of the flat surface 8-8′ and 7-7′ found on E, thus completing the half pattern. Parts D and F are developed in exactly the same manner as the part just completed.

Development of Bay Window Roof

For L. A. Atwood, Rochester, N. Y.

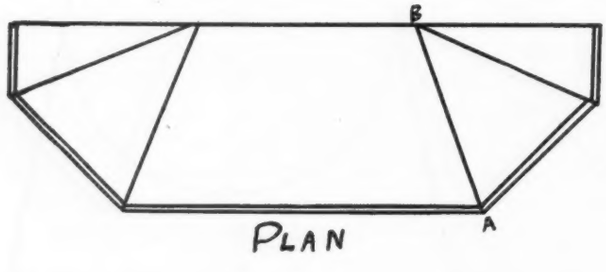
By **W. R. HAINES**
Contributing Editor

THE drawing in this issue is a typical bay window with a concave roof; the plan showing an octagon shape, sent in by Louis A. Atwood of Rochester, N. Y.

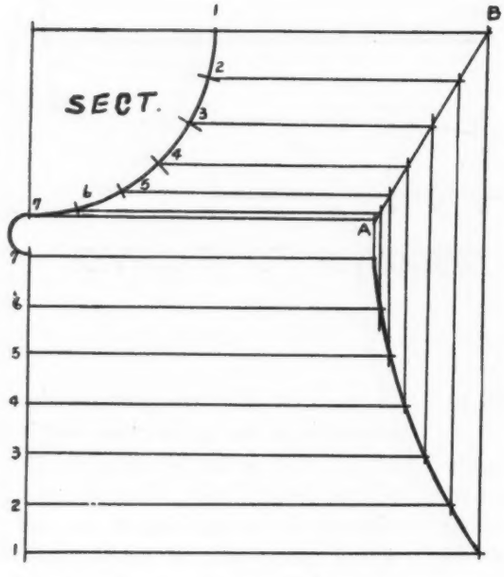
I have developed the mould in a separate drawing, because it is hard to show it in one sketch on account of projecting lines from elevation or section, and divide into equal parts, as 1, 2, 3, etc. Then draw lines from points 1, 2, 3, etc., until they intersect mitre line AB, which is the same on all four corners of your roof. From intersecting points on your mitre line AB, extend points 1, 2, 3, etc., into your stretchout, and your development is complete. The mould is developed in the same way.

into the plane of the octagon. This method should give the subscriber a better insight into his problem.

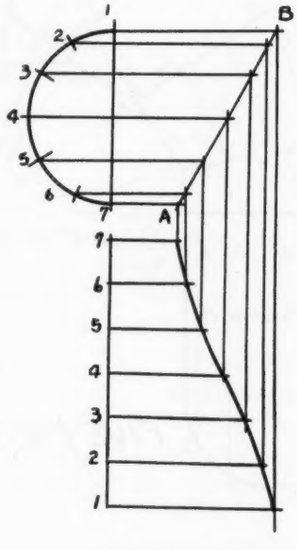
The first step is to draw a plan of your roof, which in this case is an octagon, or a circle divided into eight equal parts. Then draw the



PLAN



DEVELOPMENT 'A'



DEVELOPMENT 'B'

OVERHEAD

The method of figuring determines who gets the jobs and what kind of jobs are secured. Overhead applied on labor alone invites volume. Overhead applied on labor alone favors the job with more material than labor. Overhead applied on labor and material favors the job which runs to more labor than material.

By **PAUL R. JORDAN**

IN my former article I made three statements. The first of these statements was — overhead should be figured and figured carefully and should be included in every estimate. This statement I advanced as a fact. The second statement, namely, that overhead should be based primarily on productive labor, I advanced as an opinion. The third statement, namely, that overhead should be figured and not guessed at, I also advanced as a fact.

Let us take up the second of these statements, i. e., that overhead should be based primarily on productive labor. I advanced this merely as an opinion because many sheet metal contractors in the past have distributed their overhead for estimating purposes over labor and material equally, and I do not care to come out flatly with the statement, "They are all wrong." Nevertheless, I am firmly convinced that for most shops overhead should be based primarily on productive labor.

Our Industries Unusual

I am, of course, referring to the overhead of sheet metal and furnace contractors. Other types of business have different types of expenses which must be charged against overhead, and the difference in the type of charge may call for a difference in the basis of the charge.

The manufacturer, for instance, using and maintaining expensive equipment, has a different estimating problem from the one whose equipment is largely hand tools. Upkeep of dies and other equipment which deteriorates progressively with use; manufacturing processes using expensive materials as a part of the process, these materials do not go into the product; equipment which depreciates rapidly on account of new developments making them obsolete; and loss due to scrapping of materials on account of obsolescence or other losses; all of these expenses and many others which are not chargeable against the individual job and which must be paid before any profit can be figured, are factors which may confront other businesses when estimating overhead.

Some manufacturers using expensive equipment charge so much per hour for every machine in addition to all labor and material overhead. Some manufacturers separate their overhead into factory overhead, office overhead and sales overhead. These complicated systems of estimating overhead are not necessary for the typical sheet metal contractor.

When I say that "for most shops" overhead should be based primarily on productive labor, I have in mind that most shops handle a varied line of work. This is especially true of the small shop, and it is the small shop that I have particularly in mind. If the jobs handled by any shop run uniformly as to their ratio of material and labor, then it does not make any difference whether overhead is based on material, on labor, or on both.

If practically every job, large or small, that goes through the shop carries say 50 per cent of material and 50 per cent labor, or if every one carries 75 per cent material and 25 per cent labor, or if each carries 25 per cent material and 75 per cent labor, then the question of how to base overhead is of no importance. But when one job coming up for estimate carries 90 per cent labor and 10 per cent material and another job carries 25 per cent labor and 75 per cent material, then the question of basing overhead becomes of prime importance. Re-

ferring to that portion of your business which is competitive, the basing of overhead determines what class of business you will get and what class of business you will lose.

If you base overhead on labor and material equally, you will invite that class of business which runs largely to labor with little material. If on the other hand you base your estimate of overhead primarily on labor, then you will invite that class of business which runs largely to material and in which labor is the smaller factor.

The above can be stated as a fact because there is enough variation in estimating methods to give this important factor the balance of power in determing which jobs you will get and which jobs you will lose.

A Specific Example

For example, take two similar jobs one of which is to be erected of copper and the other to be of galvanized steel. Let us say that on the steel job there is $1,000 worth of labor and $500 worth of material. The similar job made of copper has $1,000 worth of labor and $2,500 worth of material, estimating the cost of sheet copper at five times that of sheet steel.

Let us say that two contractors are figuring these jobs, one of whom estimates his overhead at 30 per cent on labor and material, the other of whom estimates his overhead at 60 per cent based on labor only. Contractor number one figures labor $1,000, material $500, overhead $450 and 10 per cent profit (or $195) for the galvanized job, a total of $2,145. This same contractor figures the copper job at $1,000 for labor, $2,500 for material, $1,050 for overhead and 10 per cent profit (or $455), making a total of $5,005. Contractor number two figures the galvanized job at $1,000 for labor, $500 for material, $600 for overhead, 10 per cent (or $210), a total of $2,310. This same contractor figures the copper job: labor $1,000, material $2,500, overhead $600, 10 per cent profit ($410), a total of $4,510.

Here is the example set down in tables:

Copper Job

Labor	$1,000
Material	2,500

Galvanized Iron Job

Labor	$1,000
Material	500

Contractor No. 1 figures 30 per cent on labor and material. Contractor No. 2 figures 60 per cent on labor only.

Contractor No. 1 estimates—

Galvanized Iron Job

Labor	$1,000
Material	500
*Overhead—30 per cent of $1,500	450
*Profit—10 per cent of $1,950	195
Total	$2,145

Copper Job

Labor	$1,000
Material	2,500
Overhead—30 per cent of $3,500	1,050
Profit—10 per cent of $4,550	455
Total	$5,005

Contractor No. 2 estimates—

Galvanized Iron Job

Labor	$1,000
Material	500
*Overhead—60 per cent of $1,000	600
*Profit—10 per cent of $2,100	210
Total	$2,310

Copper Job

Labor	$1,000
Material	2,500
Overhead—60 per cent of $1,000	600
Profit—10 per cent of $4,100	410
Total	$4,510

*My figures of 30 per cent and 60 per cent overhead and of 10 per cent for profit are of course arbitrary.

Now on the galvanized iron job contractor number one bids $2,145. Contractor number two, $2,310. Contractor number one, who figures overhead against labor and material gets the job.

On the copper job contractor number one bids $5,005 and contractor number two bids $4,510. Contractor number two who figures overhead against labor gets the job.

Analyzing this, each job has $1,000 worth of labor, therefore one job takes as much supervision, equipment, bookkeeping and, in general, plant expense as the other. The actual plant expense of the two jobs is equal. In other words, the same plant, with the same equipment and the same number of employees and the same plant expense in general could handle an equal number of either galvanized iron or copper jobs having equal labor.

Copper More Desirable

Now let us analyze the two classes of jobs as to desirability and profit. The galvanized iron job shows overhead of $450, net profit of $175, a total gross profit of $645. The copper job shows overhead of $600, a net profit of $410 and a gross profit of $1,010. The copper job shows $365 more gross profit, running through the shop in the same time and with the same shop expense as the galvanized iron.

To look at it another way, the copper job shows $600 overhead against the same shop expense, as the galvanized job with an allowance of only $450 for overhead. The copper job shows a net profit of $455 while the galvanized job, consuming the same time and shop expense, shows a net profit of only $195.

Note this also—that if both contractors had based overhead on labor only, the galvanized job would have brought $2,310 instead of $2,145, that is $150 more overhead and $15 more profit.

I realize that there are other expenses besides plant expenses, but these expenses are small. Collection expenses and collection losses

are small. Drayage is charged in the estimate against each job, and is not overhead. Collection differences are offset to some extent by the fact that the copper job is a higher class job usually going to a high class owner and with less collection loss; also copper is usually bought only for the specific job it is to be used on and carries little storage and insurance expenses.

Of course you understand that when I speak of the copper job I am using it as an illustration. I am not recommending that any contractor make a special effort to get copper jobs, or any other particular class of work. I am using it to illustrate the general class of job where material is the large factor. I might just as well have used two galvanized iron jobs with the same amount of labor and one having lots of material and the other little material; or I might have used a furnace installation job compared with a gutter repair job as using equal labor, but unequal materials. And while the differences on the jobs set out are striking, the same principles would hold in less glaring instances.

Here Are the Facts

I could prove the same points with other illustrations, but it seems to me that this one illustration is enough, provided you will consider these jobs as general and not as specific. This illustration brings out the following facts:

1. That the method of figuring determines which contractor gets the job; it also determines which job each contractor gets, and that is more important yet.

2. That the contractor who estimates overhead on labor alone invites volume, while the contractor who applies overhead against material repels volume. Volume, if it makes no addition to expense, and carries a profit, is desirable.

3. That the contractor who bases overhead on labor and material is not figuring his overhead high enough because he is inviting more labor jobs, and it is a physical impossibility for him to crowd through his shop enough to allow him to come out on this basis.

The whole thing gets down to the fact that most overhead cost is labor cost. If you are operating a plant equipped to work five employees you have a certain amount of overhead. If your competitor around the corner is operating a plant of twenty employees his overhead is likely to be about four times as great as yours, provided you are both good, economical business men. You may argue that this should not be the case, but the fact remains that actual overhead expense varies approximately with the size of the organization. Neither the little fellow nor the big fellow has any very great advantage over the other on overhead. The little fellow often thinks he has an advantage, but he is likely to be kidding himself.

I know that in some ways it might be desirable to figure a small percentage of overhead against material while figuring the greater portion of it against labor. The only objection to this is the complication of figures which perhaps is not warranted by the importance of that particular factor.

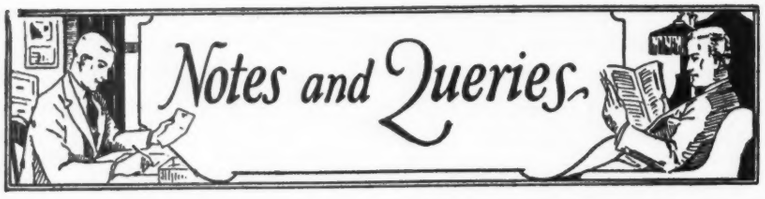
Figure the Easiest Way

I do not feel that figuring overhead against labor alone is any more complicated than figuring it against both labor and material, although many old time contractors seem to prefer it. Perhaps habit has something to do with it. As a matter of fact it seems simpler to me. Any estimate must cover actual labor and actual material. To figure overhead against one of these items is simpler than to combine the items, then figure it against both. The only element of complication is in determining the percentage necessary, and there is no reason why any business man, big or little, should not distribute his costs at the end of the year, and definitely know just what he has done. I will however treat of this in another article.

There is something to be said, on the basis of accuracy, in favor of basing overhead on hours of labor rather than on labor costs; in other words, on labor hours rather than labor dollars. The objection to this is the fact that the estimator when he makes up his estimate does not know who will perform the labor. If one man is capable of turning out 50 per cent more than another and receives 50 per cent higher wages, then the estimator figures labor and overhead on an equal basis, allowing current shop conditions to determine which one will handle the job. It is manifestly impractical for an estimator in general to take into consideration just which man, or men, will do the work. And the basis of labor dollars gives reasonable accuracy.

I believe, therefore, that overhead should be based primarily on labor. That method, within practical limits, is most accurate. It places the expense where it belongs, with the ultimate result of more accurate and better estimating, better sales, fewer losses and better profits.

In bringing this discussion of Overhead to a close we have an article by J. G. Dingle that just must be published. In this article he has taken typical figures and from them worked out facts that you simply can't afford to pass up without reading. The article will appear in the first issue of 1931. It is going to be a fitting close to our wide discussion on Overhead.



"Stibloy"

From American Heating and Supply Company, Rockford, Illinois.

Who makes a preparation for cleaning discolored and warehouse stained galvanized steel sheets?

Ans.—Liquid Metal Products Company, 231 South LaSalle Street, Chicago, make "Stibloy," used for this purpose.

Repairs for "Crystal" Washing Machine

From Clemens Rinderman, Freeport, Illinois.

Where can I buy a cylinder for a "Crystal" electric washing machine, 1922 model?

Ans.—Chicago Repair and Sales Store, 1528 South Crawford Avenue, Chicago.

"Breese" Draft Regulator

From Freise & Knebes, La Crosse, Wisconsin.

Please tell us who makes the "Breese" draft regulator.

Ans.—Breese Brothers Company, 2347 Reading Road, Cincinnati, Ohio.

Stokers

From L. F. Diddie, Marshfield, Wisconsin.

Please give me a list of manufacturers of automatic stokers, in addition to the Iron Fireman Manufacturing Company of Portland, Oregon, and Combustioneer, Inc., Goshen, Indiana.

Ans.—The Brownell Company, Dayton, Ohio; Armstrong Manufacturing Company, Springfield, Ohio; Domestic Stoker Company, 7 Dey Street, New York City; Ever-Ready Coal Burner Company, 209 East Baltimore Avenue, Detroit, Michigan; Fire-King Stoker Company, 1160 Roosevelt Road, Indianapolis, Indiana; Paragon Kol Master Corporation, Oregon, Illinois; Phanton Stoker Company, 1231 Hanna Building, Cleveland, Ohio; Uniflow Corporation, Sidney, Ohio; Black Servant Manufacturing Company, 2953 North Market Street, St. Louis, Missouri; Pettigrew Foundry Company, 540 North Michigan Avenue, Chicago.

Conversion Gas Burners for Warm Air Furnaces

From Keith Furnace Company, Des Moines, Iowa.

Please give us a list of firms making conversion gas burners for warm air furnaces—(not furnace manufacturers.)

Ans.—Cleveland Gas Burner and Manufacturing Company, 3702 Superior Street, Cleveland, Ohio; Columbia Burner Company, 1645 Dorr Street, Toledo, Ohio; Franklin Gas Burner Company, 821 East Eighth Street, Cincinnati, Ohio; Johnson Gas Appliance Company, Cedar Rapids, Iowa, and Standard Heating and Radiator Company, 220 Penn Avenue, Pittsburgh, Pennsylvania.

Radiator Shields

From R. E. Warner, Springfield, Illinois.

Please advise me who manufactures radiator shields.

Ans.—Beh and Company, 1140 Broadway, New York City; Hart and Cooley Manufacturing Company, Holland, Michigan; Thomas and Armstrong Company, London, Ohio, and Tuttle and Bailey Manufacturing Company, 407 South Dearborn Street, Chicago.

Aquarium Cement

From McQuown Sheet Metal Company, Punxsutawney, Pennsylvania.

Can you tell us who manufactures aquarium cement?

Ans.—Wm. Connors Paint Manufacturing Company, Troy, New York.

"Famous" Furnace

From C. M. Baugh & Son, Cambridge, Illinois.

We should like to know who makes the "Famous" furnace. Is it made in Milwaukee, Wisconsin?

Ans.—Phipps Furnace Company, 331 Fourth Street, Milwaukee, Wisconsin.

Incinerators

From Walter A. Sargent, Pekin, Illinois.

Who manufactures incinerators or garbage burners to be installed in the basement of the home?

Ans.—Economy Incinerator Company, 228 North LaSalle Street; Kerner Incinerator Company, 612 North Michigan Avenue; Mid-West Incinerator Company, 154 East Erie Street, and Stearns Incinerator Company, 188 West Randolph Street, all of Chicago.

Register Shields

From R. E. Warner, Springfield, Illinois.

Please tell me who manufactures warm air register shields.

Ans.—Beh and Company, 1140 Broadway, New York City, and Hall-Neal Furnace Company, 1322 North Capitol Avenue, Indianapolis, Indiana.

"Quaker" Steel Furnace

From Petro Sheet Metal Works, Three Rivers, Michigan.

From C. H. Jeffers, West Mansfield, Ohio.

Please advise if the "Quaker" steel furnace is still being made, and by whom?

Ans.—Quaker Manufacturing Company, 215 North Michigan Avenue, Chicago.

"Hero" Furnaces

From Gus Scheipering, Quincy, Illinois.

Can you tell us who manufactures the "Hero" furnaces?

Ans.—Standard Foundry and Furnace Company, De Kalb, Illi-

Second-Hand Printing Press

From W. L. Enix, Spartanburg, South Carolina.

Where in Chicago can I buy a small second-hand printing press?

Ans.—Refer to A. F. Wanner Company, 716 South Dearborn Street.

Concrete Nail

From Farnam Sheet Metal Works, Omaha, Nebraska.

Who in Chicago makes the smooth, hard, concrete nail?

Ans.—American Steel and Wire Company, 208 South LaSalle Street.

ASSOCIATION ACTIVITIES

Sheet Metal Cont'rs of Northern Illinois Hold Annual Meeting

The Annual Northern District Meeting of the Sheet Metal Contractors' Association of Illinois was held in the rooms of the Sheet Metal Employers' Association of Chicago, Chicago, Illinois, on Friday, November 14, 1930.

Thirty-three members, representing nine cities, were present.

George C. Clark, chairman of the Convention Program Committee, reported his committee was making splendid progress, and would be able to announce the convention headquarters within the next two weeks.

John Maier reported disposing of 69 copies of Standard Practice in Sheet Metal Work, since last April.

Albert Wagner, speaking on distribution of Standard Practice, recommended that employers present their employees with a copy of Standard Practice in Sheet Metal as a Xmas gift.

The meeting adjourned at 5:00 P. M. and all present were then taken to the Hamilton Club, where the Chicago boys had arranged for a wonderful dinner.

Geo. Krutzhoff, president of the Chicago Association, acted as toastmaster of the evening.

Jos. J. Walter, state president, talked on "Why I Should Belong to the Sheet Metal Contractors Association."

Among others who responded were Secretary Chas. L. Radtke, Peter Biegler, Harry Mansfield, Alfred B. Rysdon, Fred Bremer, Thomas Shean and Thomas Sturton.

Akron, Ohio, Heating and Sheet Metal Men Meet

The Warm Air Heating Contractors' Association and the Sheet Metal Contractors' Association of Akron, Ohio, on November 18, held a meeting which was well attended by members and non-members of both associations from the city of Akron.

A. E. Lamneck, Congressman-elect of Columbus, Ohio, gave a very interesting talk on Warm Air Heating and the installation of heating equipment. The information derived from Mr. Lamneck was of the greatest benefit to warm air heating contractors.

Frank C. Park, secretary and manager of the Trade Associations Service Company, was also in attendance and demonstrated with large charts the Cost and Accounting System and forms approved by the National Association of Sheet Metal Contractors. Through the demonstration made by Mr. Park, the sheet metal contractors and warm air heating contractors were given a thorough knowledge of what Overhead Expense was and the method of figuring the same.

As explained to the members, this Cost Record and Bookkeeping System is now ready for delivery, and any contractor who does not have an adequate cost system in his business can now investigate this new Cost and Accounting System devised particularly for the sheet metal trade.

Illinois 1930 District Meeting Held in Peoria, Nov. 6

The 1930 district meeting of the Sheet Metal Contractors Association of Illinois, of the south and central part of the state, was held at Peoria, Illinois, on November 6, 1930.

Meeting was called at 2 p. m. at the Association rooms of the Peoria Sheet Metal Contractors, Wheelock Building, 218 S. Adams Street.

Wisconsin Announces Program of 1931 Annual Meeting

The monthly meeting of the board of directors of the Sheet Metal Contractors Association of Wisconsin was held in Milwaukee, Wisconsin, Wednesday, November 5th.

The secretary reported that organization work is being carried on through correspondence but it was the opinion of the majority present that the secretary visit the locals throughout the state before convention time for the good of the entire organization.

Here are the highlights of the 1931 convention:

Address—"Your Business Records"—F. C. Park, Pittsburgh, Pa.

Address—"My Overhead as Applied in My Business"—C. F. Warning, Oshkosh, Wis.

Election of Officers.

Tuesday, February 3, 1931

Address—"Let's Talk It Over"—Bennett Chapple, Vice-President American Rolling Mill Company, Middletown, Ohio.

Address—"What Is Your Compensation Insurance?"—George Hayden, Wisconsin Compensation Rating and Inspection Bureau, Milwaukee.

Address—"The Design of Sheet Metal Ducts in Connection with Air Conditioning" by Platte Overton, Chicago, Ill.

Sheet Metal and Warm Air Heating Contractors' Association of Indiana—January 20, 21, 22, 1931, at Ft. Wayne, Indiana. Paul R. Jordan, Executive Secretary, 631 South Deleware Street, Indianapolis, Indiana.

Sheet Metal Contractors' Association of Wisconsin—February 2-3, 1931, at Milwaukee, Wisconsin. Paul L. Biersach, Secretary, 853 Grant Boulevard, Milwaukee, Wisconsin.

Sheet Metal Contractors' Association of Florida—March 30-31, 1931, at Miami, Florida. G. H. Leavitt, Secretary-Treasurer, 909 Main Street, Tampa, Florida.

Joint Convention—Sheet Metal Contractors' Association of Illinois and National Association Sheet Metal Contractor — May 12-15, 1931, at Chicago, Illinois. A. B. Rydon, Secretary, Associated Sheet Metal Employers of Chicago, 350 North Clark Street, Chicago, Illinois.

NEW ITEMS *and* NEWS ITEMS
From and about the Manufacturers and Jobbers

Inland Steel Employees Plan Worker Relief

The employes of Inland Steel Company have developed a plan for the relief of their fellow workers for whom no employment can be provided under present conditions.

Although the company has spared no effort in pro-rating work among the largest possible number of employes, current volume of business does not permit the retention of all of the regularly employed workers on the pay roll of the company.

Those who are employed have voluntarily pledged a portion of their earnings to a relief fund, and the company has agreed to contribute an equal amount. The contribution of the employes varies with their earnings from about two per cent to five per cent. Employes earning less than $125 a month have not been asked to contribute, except single men with no dependents.

To distribute the money so collected, arrangements have been made to secure the services of trained social workers who will act as visitors and as advisors to the Central Committee of the employes.

The expense incurred in the distribution of the relief fund will be borne by some of the executives of Inland Steel Company, thereby permitting all the money contributed for relief to be used for this purpose.

Standard Furnace & Foundry Co. Announces a New Furnace

The Standard Foundry & Furnace Company of De Kalb, Illinois, announce a new furnace—the Titan, 1200 Series—which is claimed to be the highest rated furnace, for its size, on the market. This claim is on the basis of Standard Code Rating.

The high rated efficiency is only one of the superior points stressed by the manufacturer. Not only is it a more efficient heater, but it is unusually heavy. The castings for the firepot are fluted to give greater radiation area, but the sides are nearly vertical on account of the large size grate. The firepot castings are made in two pieces, fitted with the Titan gas-tight and dust-tight interlocking joint. Due to the fact that the fire pot is sectional and that the sections are of such heavy castings, the chance for cracking is said to be practically eliminated.

Of great interest to the furnace man is the new type of grate construction in this new 1200 Series Titan Furnace. There are three pieces to this large grate—divided into two sections. First is an outer ring, with slotted edges and with short upright lugs. This ring is operated by the upright "shaking" lever, being rotated 90 degrees if desired, on ball bearings. This shakes down the ashes all around the outer edges of the fire pot, thus keeping a fresh, clean fire all the time.

The center section of the grate is the dumping section. Made in two parts, it

is operated by the dumping lever through the ash door. While possible to "dump" the fire through this, it is possible to open this, clear the fire, and not lose the entire fire.

By a novel adaptation of the old Titan construction, it is possible to remove any part, or all, of this grate by merely taking out a cotter pin inside of the ash pit door.

American Foundry & Furnace Co. Feature Air Conditioning Units

The "June-Aire Heating System" is attractively presented in an 8-page bulletin issued by the American Foundry & Furnace Co., Bloomington, Ill. The "June-Aire Weathermatic" described in this bulletin is a completely automatic warm air heating and air conditioning unit built in different designs for oil, gas or coal.

Filter humidifier, positive pressure blower, automatic temperature control, as well as a heating unit especially designed for the type of fuel to be used, are self-contained in the June-Aire Weathermatic.

Another bulletin features the American Filtered-Aire Unit, which consists of a standard warm air furnace with automatic humidifier and thermostat and a separately encased unit installed in the cold air return, including air filter, positive pressure blower and bypass damper. Suresheet Fan Furnace Units for churches, garages, stores, etc., are also featured.

Ryerson Acquires Stock and Good Will of Boston Firm

Joseph T. Ryerson & Son, Inc., has recently acquired the stock and good will of the sheet metal division of the Richards Company, Inc., Boston, Mass.

The Richards Company, Founded in 1812, has built up a very good business during its 119 years of importing and distributing nonferrous metals, rolling mill products and metal workers' supplies. It will continue in business, specializing in pig metals.

Stocks taken over by Ryerson include Armco black and galvanized sheets, lead coated, galvannealed, and Bay State blue sheets in addition to a diversified line of standard and special sheets which have been carried regularly in the Ryerson warehouses at Third, Binney and Munroe Sts., Cambridge, Mass.

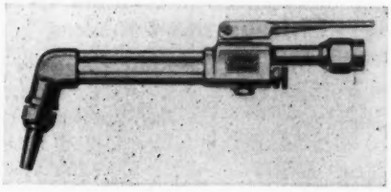
In 1926 the Ryerson organization first entered the Boston territory through the purchase of the reinforcing bar division of the Penn Metal Company. Two years later the plant, good-will and steel merchandise of the E. P. Sanderson Company were added. With the recent purchase, increasing Ryerson sheet metal facilities, this company has one of the largest and most complete steel-service plants in the New England States.

Since the founding of the Ryerson concern in 1842, it has enjoyed a continuous expansion program, and today offers nation-wide service with plants at Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Philadelphia, New York and Boston. It is also represented in many other industrial centers throughout the country.

New Attachments for the Oxweld W-17 Welding Blowpipe

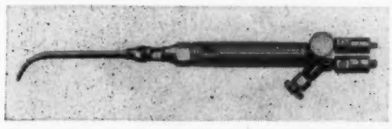
Oxweld Acetylene Company, New York, has recently introduced new accessories for the Type W-17 welding blowpipe, introduced during the past winter, which now make this blowpipe capable of doing almost any type of work which may be required of an oxy-acetylene blowpipe.

The Type CW-17 cutting attachment enables the blowpipe to do a



reasonably wide range of cutting work. A long handle is used for operating the cutting oxygen valve. When this handle is not in use, it can be pulled forward parallel to the tubes so that the whole attachment may be carried around in the operator's pocket. The injector for the heating flames is contained in the attachment. At the rear of the attachment near the bottom is an adjusting screw, so that the oxygen for the heating flames may be regulated by the operator's thumb and forefinger while the blowpipe is in operation. The attachment is supplied with two cutting nozzles.

Another accessory which has just been introduced for use with the W-17 welding blowpipe is the W-17

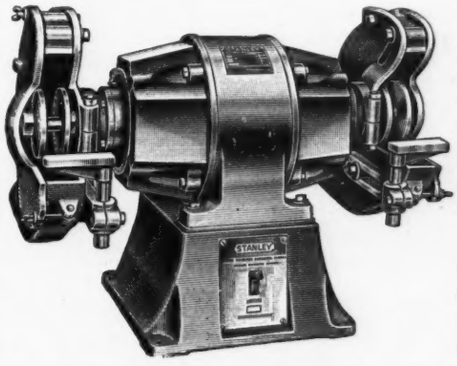


to W-15 adaptor which makes it possible to use any of the welding heads available for the Oxweld W-15 sheet metal welding blowpipe with the Type W-17 welding blowpipe handle. This means that the W-17 welding blowpipe may be used on work ranging from the lightest type of welding to heavy general welding work.

Stanley Electric Co. Introduces New and Larger Unishear

The Stanley Electric Company of New Britain, Conn., are now selling a new and larger Unishear known as Type B. It has been named, by some, the big brother to the "Mighty Midget" because the cutting principle is very similar. However, the similarity stops there. Type "B" has a cutting capacity up to ¼-in. boiler plate. Mighty Midget cuts up to 18 U. S. gauge hot rolled steel. Type "B" 36-in. throat weighs about 5500 lbs., whereas Mighty Midget weighs only 6½ lbs.

Type "B" will cut at a speed up to 10 ft. per minute depending on how fast the operator wants to guide the sheet through the shears.



It is also possible to cut any desired curve and to cut complete circles with a minimum radius of 6 in. on ¼-in. material and even less than 3-in. radius on lighter material. It can cut or trim the edges of flat stock to within less than the thickness of the sheet.

Type "B" Stanley Unishear can be made for either motor or belt drive. If a motor is desired it can be built into the machine, making a complete unit. A 2-h.p. motor is all that is required.

The Stanley Electric Tool Company, New Britain, Conn., has prepared a booklet that tells what the machine will do and describes in detail the construction of this unique machine.

Armco's Pattern Drafting Course in Book Form

The series of articles on pattern drafting which have been running in Ingot Iron Shop News during 1929 and the first part of 1930 have now been compiled in booklet form. The lessons run consecutively through the book just as they ran in the News.

This series was written by Martin J. Raubenstraw, instructor of the Sheet Metal Department, Carnegie Institute of Technology.

This booklet will be sent free to any contractor writing American Rolling Mill Company, Middletown, Ohio.

New Milcor Furnace Pipe and Fittings Catalog

The latest edition of the Milcor Furnace Pipe and Fittings Catalog, No. 30, is now ready for distribution, It is a more or less complete handbook on the subject of furnace fittings, stove pipe and elbows, and registers for use by furnace contractors. It is a compilation of important data that should be of value as a source of reference on the installation of furnace fittings.

Catalog No. 30 is made up of nine sections, each illustrating and describing the different types of fittings and accessories, including prices and typical installation diagrams. This arrangement enables the contractor to figure estimates and orders faster and easier, with the knowledge that he is working from correct data.

One of the special features shown in this catalog is a new type of construction for Milcor Single Tin Wall Pipe and Fittings. This is the "Selflock" seam, a device which dispenses with the use of tools, solder, rivets, bolts and screws in assembling and erecting. Milcor Selflock Wall Pipe is assembled by simply pressing the tongue into the Selflock seam until it clicks, then by turning the ends over the seam the pipe is securely locked. The end locks are also constructed on this principle.

Another departure in construction is the Selflock seam applied to stove pipe, obviating the need for tools for assembling; and putting the seam outside, giving rigidity and minimizing the collection of soot or corrosion on the inside.

Catalog No. 30 can be obtained by writing to the Milcor Steel Company, Milwaukee, Wisconsin.

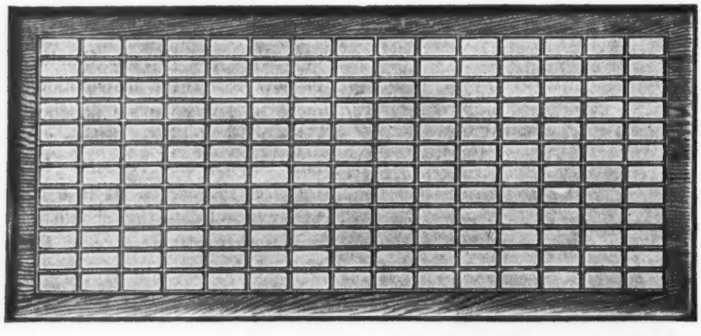
Rock Island Register Co. Is Making Steel Floor Registers and Cold Air Faces

The illustratons below show, one, the new Rock Island Steel cold air and ventilating face. It is claimed by the manufacturers that the design and construction allow increased free air capacity while maintaining extra strength and durability by means of an increased number of support bars.

The bars besides being more in number than customary are also of such depth as to enable the installer to put them in without cutting support bars into joists.

The overall depth is 1⅜ inches and it is stated that the support bars are placed to provide greater rigidity and durability where most needed.

The second illustration shows the new Rock Island Steel Floor register.



The manufacturers claim that the face is composed of narrower bars to provide maximum air capacity. The louvre mechanism is an exclusive feature and is claimed to be extremely simple and noiseless. The operating lever is small and extremely easy to manipulate. The louvre mechanism is such that the louvres can be set to stay at any desired opening.

The overall depth of this new register is 1¼ inches and the manufacturers state that this provides saving in weight and space in shipping, storage and carrying on the job.

Both of these new items are made in all standard sizes and furnished in the new attractive and durable oak grain finish. A new catalog is now in preparation giving full details of these products and the regular line of No-Streak, Out-O-Wall, Island City and Vul-Um registers. Dealers desiring a copy of this catalog may obtain same by addressing the Rock Island Register Company at Rock Island, Illinois.

New Niagara Machines Announced

An attractive new 8-page bulletin has been issued by the Niagara Machine & Tool Works, Buffalo, N. Y., featuring "New Niagara Machines for Working Sheet Metal." Among the new machines shown is the No. 180 Electric Combination Machine with a capacity up to 14 gauge, which makes it available for heavy duty work; Slip Roll Formers with new mechanical features, and a new line of Beaders. Squaring Shears, Folders, Slitters, Groovers and the Combination Bench Machines are also shown in this bulletin.

Improvements Announced in Chicago Steel Brakes

The Dreis & Krump Mfg. Co., pioneer manufacturers of sheet metal working machinery, Chicago, have announced a new model of their Chicago Steel Hand Bending Brake. Chicago Steel Brakes of this type have been on the market for over thirty years. In this new machine the changes in design are as follows:

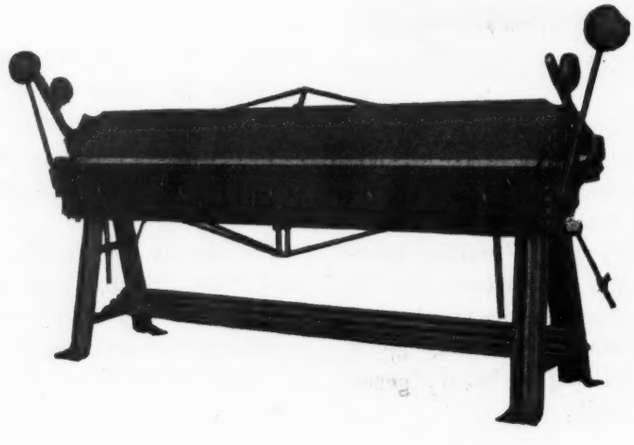
Electric arc welding has replaced riveting of all rolled steel sections. The leg design has been changed from angle bars to pressed steel sections as shown in the illustration. This adds to the strength as well as improves the appearance of the machines, and the construction provides cross bars in the legs which can be used for shelf to hold the formers, which are standard equipment.

A new type adjusting link has been provided eliminating the old eccentric adjustment. Adjustment is now provided by a sliding block adjusted by set screws. This link provides four times the adjustment of the old eccentric link and is an important feature used in connection with special bending where bars are required to be clamped in with the material to be bent such as in making internal and part sheet bends.

An attractive new bulletin describing these machines, will be mailed by the manufacturer to anyone interested.

Stanley Announces Motor-Driven Hand Shear

The "Mighty Midget," the motor-driven hand shear of the Unishear family, is featured along with bench and stand models in an attractive four-page letter of the Stanley Electric Tool Co., Inc., New Britain, Conn. According to the manufacturer, the "Mighty Midget" is easier to handle than a pair of snips and does smoother, cleaner work." It is claimed that this shear "will cut an alphabet out of 5/64-inch stock . . . like cutting paper with scissors." It is said to average a cutting capacity of 15 feet per minute on No. 18 gauge hot rolled steel or galvanized iron.



~ MARKET QUOTATIONS ~

AMERICAN ARTISAN is the only publication quoting Prices on Metals, Sheet Metal Equipment and Supplies, Warm Air Heating Supplies and Accessories, corrected bi-weekly. These quotations are not guaranteed but are obtained from reliable sources and reflect nation-wide market conditions at the time of going to press.

NOTE—These prices are Chicago Warehouse Prices to which must be added territory differentials

METALS

PIG IRON

Chicago Fdy., No. 2	$17.50
Southern Fdy. No. 2	$17.51 to 17.51
Lake Superior Charcoal	27.04
Malleable	17.50

FIRST QUALITY BRIGHT CHARCOAL TIN PLATES

IC	20x28	112 sheets	$22.50
IX	20x28		25.50
IXX	20x28	56 sheets	14.50
IXXX	20x28		15.56
IXXXX	20x28		17.00

TERNE PLATES

	Per Box
IC 20x28, 40-lb. 112 sheets	$24.00
IX 20x28, 40-lb. 112 sheets	26.50
IC 20x28, 25-lb. 112 sheets	20.50
IX 20x28, 25-lb. 112 sheets	23.50
IC 20x28, 20-lb. 112 sheets	19.00
IV 20x28, 20-lb. 112 sheets	22.00

"ARMCO" INGOT IRON PLATES

No. 8 ga.—110 lbs.	$4.15
3/16 in.—100 lbs.	4.05
¼ in.—100 lbs.	3.85

COKE PLATES

Cokes, 80 lbs., base, 20x28	$12.00
Cokes, 90 lbs., base, 20x28	12.20
Cokes, 100 lbs., base, 20x28	13.75
Cokes, 107 lbs., base, IC, 20x28	12.75
Cokes, 135 lbs., base, IX, 20x28	14.75
Cokes, 155 lbs., base, 2X, 56 sheets	8.50
Cokes, 175 lbs., base, 3X, 56 sheets	9.35
Cokes, 195 lbs., base, 4X, 56 sheets	10.25

BLUE ANNEALED SHEETS

Base 10 ga. per 100 lbs.	$3.35
"Armco" 10 ga. per 100 lbs.	4.15

ONE PASS COLD ROLLED BLACK

No. 18-20 per 100 lbs.	$3.75
No. 22 per 100 lbs.	3.70
No. 24 per 100 lbs.	3.75
No. 26 per 100 lbs.	3.85
No. 27 per 100 lbs.	3.90
No. 28 per 100 lbs.	4.00

GALVANIZED

No. 16 per 100 lbs.	$3.85
No. 18 per 100 lbs.	3.95
No. 20 per 100 lbs.	4.15
No. 22 per 100 lbs.	4.20
(Standard differentials on extras to apply)	
No. 24 per 100 lbs.	$4.35
No. 26 per 100 lbs.	4.60
No. 27 per 100 lbs.	4.70
No. 28 per 100 lbs.	4.85
"Armco" 24 per 100 lbs.	5.95

BAR SOLDER

Warranted 50-50 per 100 lbs.	$19.00
45-55 per 100 lbs.	17.50
48-52 per 100 lbs.	18.00
Plumbers' per 100 lbs.	15.50

ZINC

In Slabs	$5.00

SHEET ZINC

Cask Lots (600 lbs.)	$12.00
Sheet Lots (100 lbs.)	13.00

BRASS

Sheets, Chicago base	18⅝ c
Tubing, brazed, Chicago base	26⅛ c
Tubing, seamless, Chicago base	23½ c
Wire, Chicago base	19⅛ c
Rods, Chicago base	16⅜ c

COPPER

Sheets, Chicago base	21⅜ c
Tubing, seamless, Chicago base	24⅜ c
Wire, plain rd., 8 B. & S. Ga. and heavier	14⅛ c

LEAD

American Pig	$6.00
Bar	7.50

TIN

Bar Tin per 100 lbs.	$32.00
Pig Tin per 100 lbs.	31.00

SHEET METAL SUPPLIES, WARM AIR FURNACE FITTINGS AND ACCESSORIES

ASBESTOS

Paper up to 1/16	6c per lb.
Roll board	7½ c per lb.
Mill board 3/32 to ⅛	7½ c per lb.
Corrugated paper (250 sq. ft. per roll)	$6.00 per roll

ASBESTOS SEGMENTS

8 in. per 100 sets	$7.30
9 in. per 100 sets	8.30
10 in. per 100 sets	9.30
12 in. per 100 sets	10.50

CEMENT FURNACE

5-lb. cans, net	$0.40
10-lb. cans, net	0.80
25-lb. cans, net	2.00
Per 100 lbs.	7.50

CLIPS

Damper

No-Rvet Steel, with tail pieces, per gross	$9.50
Rivet Steel, with tail pieces, per gross	7.50
Tail pieces, per gross	2.40

COPPER FOOTING

Copper Footing	41 %

CORNICE BRAKES

Chicago Steel Bending

Nos. 1 to 6B	Net

CUT-OFFS

Cal., plain, round or cor. rd.

26 gauge	30 %
28 gauge	35 %

DAMPERS

Yankee Warm Air

7 inch, doz.	$1.60
8 inch, doz.	2.20
9 inch, doz.	2.60
10 inch, doz.	2.80
12 inch, doz.	3.50
14 inch, doz.	5.00

EAVES TROUGH

Galv. Crimpedge, crated	75-15 %
Zinc	60 %

ELBOWS

Conductor Pipe

Galv. plain or corrugated, round flat Crimp.

28 gauge	60-10 %
26 gauge	50 %
24 gauge	15 %

Galv. Terne Steel

Plain Rd. and Rd. Corr.

28 gauge	60-10 %
26 gauge	50 %
24 gauge	15 %

Square Corrugated

28 gauge	55 %
26 gauge	40 %

Portico Elbows

Standard Gauge Conductor Pipe, plain or corrugated.

Not nested	70 & 5 %
Nested solid	70 & 5 %

Sq. Corr., A. & B. & Octagon

28 gauge	55 %
26 gauge	40 %

Portico

1, 1¼, 1½ inch	45 %

Copper

16 oz. all designs	50 %

Zinc

All styles	60 %

ELBOWS—Stove Pipe

1-piece Corrugated, Uniform Blue

No. 28 Gauge.	Doz.
5 inch	$1.15
6 inch	1.25
7 inch	1.75

Adjustable—Uniform Blue

No. 28 Gauge, Uniform Blue.	
5 inch	$1.60
6 inch	1.75
7 inch	2.10

WOOD FACES—60 % off list.

FIRE POTS

	Each
No. 02 Gasoline Torch, 1 qt.	$5.13
No. 9250, Kerosene, or Gasoline Torch, 1 qt.	6.50
No. 10 Tinner's Furnace Square tank, 1 gal.	11.20
No. 15 Tinner's Furnace Round tank, 1 gal.	10.70
No. 21 Gas Soldering Furnace	8.00
No. 110 Automatic Gas Soldering Furnace	10.50

GLASS

Single and Double Strength, A, all brackets	85 %
Single and Double Strength, B, all brackets	87 %

HANGERS

Conductor Pipe

Milcor Perfection Wire	25 %
Milcor Triplex Wire	10 %

Eaves Trough

Steel (galv. after forming) from list	45 %
Selflock E. T. Wire, List	10 %

HOOKS

Conductor

"Direct Drive" Wrought Iron for wood or brick	15 %

MITRES

Galvanized Steel Mitres

28 gauge	70
26 gauge	60-20

PASTE

Asbestos Dry Paste

200-lb. barrel	$15.00
100-lb. barrel	7.75
50-lb. pail	4.50
25-lb. pail	2.50
10-lb. bag	1.20
5-lb. bag	0.60

PIPE

Galvanized

Crated and nested (all gauges)	75-12½ %
Crated and not nested (all gauges)	75-7½ %

Furnace Pipe

Double Wall Pipe and Fittings	60 %
Single Wall Pipe, Round Galvanized Pipe	60 %
Galvanized and Tin Fittings	60 %

Lead

Per 100 lbs.	$12.50

Stove Pipe

"Milcor" "Titelock" Uniform Blue Stove

28 gauge, 5 inch U. C. nested	$11.00
28 gauge, 6 inch U. C. nested	12.00
28 gauge, 7 inch U. C. nested	14.00
30 gauge, 5 inch U. C. nested	10.25
30 gauge, 6 inch U. C. nested	11.00
30 gauge, 7 inch U. C. nested	13.00

T-Joint Made Up

6 inch, 28 ga. per doz.	$3.40

REGISTERS AND FACES

Floor Registers

Except Cast Iron	40 & 10 %
Cast Iron	20 %

Baseboard

2-Piece	40 & 10 %
1-Piece	40-10 & 20 %

Adjustable Ventilators

Adjustable Cold Air Faces	40 & 10 %
Adjustable Ventilators	40 & 10 %

RIDGE ROLL

Galv. Plain Ridge Roll, b'dld	75-15-5 %
Galv., Plain Ridge Roll, crated	75-15 %

SCREWS

Sheet Metal

7, ½ x ⅛, per gross	$0.52
No. 10, ¾ x 3/16, per gross	0.68
No. 14, ⅞ x ¼, per gross	0.83

SHEARS, TINNERS' AND MACHINISTS'

Viking	$22.00

Lennox Throatless

No. 18	35 %
Shear blades	10 %
(f. o. b. Marshalltown, Iowa.)	

SHOES

Galv. 28 Gauge, Plain or Corrugated, round flat crimp	60 %
26 gauge, round flat crimp	50 %
24 gauge, round flat crimp	15 %

SNIPS

Tinners'	Net

VENTILATORS

Standard	30 to 40 %
Milcor	Net

BUYERS' DIRECTORY

Air Cleaners
American Fdy. & Furnace Co., Bloomington, Ill.
Meyer & Bro. Co., F., Peoria, Ill.
Warm Air Furnace Fan Co., Cleveland, Ohio
Watt Mfg. Co., Sterling, Ill.

Air Washers
A. Gehri & Co., Tacoma, Wash.
Watt Mfg. Co., Sterling, Ill.

Aluminum Sheets
J. M. & L. A. Osborn Co., Cleveland, Ohio

Asbestos—Liquid
Technical Products Co., Pittsburgh, Pa.

Bearings
Fafnir Bearing Co., New Britain, Conn.

Blast Gates
Berger Bros. Co., Philadelphia, Pa.

Blower Bearings
Fafnir Bearing Co., New Britain, Conn.

Blowers—Furnace
American Fdy. & Furnace Co., Bloomington, Ill.
American Machine Products Co., Marshalltown, Iowa
A. Gehri & Co., Tacoma, Wash.
Brundage Co., Kalamazoo, Mich.
Lakeside Co., Hermansville, Mich.
Warm Air Furnace Fan Co., Cleveland, Ohio
Watt Mfg. Co., Sterling, Ill.

Bolts—Stove
Lamson & Sessions Co., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Brakes—Bending
Dreis & Krump Mfg. Co., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
Peck, Stow & Wilcox Co., Southington, Conn.

Brakes—Cornice
Dreis & Krump Mfg. Co., Chicago, Ill.

Brass and Copper
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Copper & Brass Research Association, New York, N. Y.
Revere Copper & Brass, Rome, N. Y.

Bronze
Revere Copper & Brass, Rome, N. Y.

Cans—Garbage
Diener Mfg. Co., G. W., Chicago, Ill.
Osborn Co., The J. M. & L. A., Cleveland, Ohio

Castings—Malleable
Fanner Mfg. Co., Cleveland, Ohio

Ceilings—Metal
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Chaplets
Fanner Mfg. Co., Cleveland, Ohio

Cleaners—Vacuum
Brillion Furnace Co., Brillion, Wis.
National Super Service Co., Toledo, Ohio

Copper
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Revere Copper & Brass, Rome, N. Y.
Rockford Sheet Steel Co., Rockford, Ill.

Cornices
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Cut-offs—Rain Water
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Dampers—Quadrants—Accessories
Aeolus Dickinson Chicago, Ill.
Hart & Cooley Co., Holland, Mich.
Howes Co., S. M., Boston, Mass.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Parker-Kalon Corp., New York, N. Y.

Dampproofings
Lastik Products Corp., Pittsburgh, Pa.

Damper Regulators
Sheer Co., H. M., Quincy, Ill.

Diffuser—Air Duct
Aeolus Dickinson Chicago, Ill.

Drills—Electric
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
J. M. & L. A. Osborn Co., Cleveland, Ohio
The Stanley Electric Tool Co., New Britain, Conn.

Drive Screws—Hardened Metallic
Parker-Kalon Corp., 190 Varick St., New York

Dust Eliminator
Dustless Ash Co., Muskegon, Mich.

Eaves Trough
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Rockford Sheet Steel Co., Rockford, Ill.

Elbows and Shoes—Conductor
Apex Gutter Hanger Corp., New York, N. Y.
Barnes Metal Products Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Rockford Sheet Steel Co., Rockford, Ill.

Fittings—Conductor
Barnes Metal Products Co., Chicago, Ill.
Braden Mfg. Co., Terre Haute, Ind.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Fluxes—Soldering
Kester Soldering Co., Chicago, Ill.

Furnace Cement
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Lastik Products Corp., Pittsburgh, Pa.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Technical Products Co., Pittsburgh, Pa.

Furnace Chain
Hart & Cooley Co., Holland, Mich.

Furnace Cleaners—Suction
Brillion Furnace Co., Brillion, Wis.
National Super Service Co., Toledo, Ohio

Furnace Fans
A-C Mfg. Co., Pontiac, Ill.
American Fdy. & Furnace Co., Bloomington, Ill.
Brundage Co., The, Kalamazoo, Mich.
Lakeside Co., Hermansville, Mich.
Robinson Co., A. H. Massillon, Ohio
Warm Air Furnace Fan Co., Cleveland, Ohio
Watt Mfg. Co., Sterling, Ill.

Furnace Filters
Warm Air Furnace Fan Co., Cleveland, Ohio

Furnace Paste
Western Mineral Products Co., Omaha, Neb.

Furnace Pokers
Fanner Mfg. Co. Cleveland, Ohio

Furnace Pulleys
Hart & Cooley Co., Holland, Mich.

Furnace Regulators
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Sheer Co., H. M., Quincy, Ill.
Tisch, Inc., Charles, Brooklyn, N. Y.
White Mfg. Co., Minneapolis, Minn.

Furnace Rings
Forest City-Walworth Run Foundries Co., Cleveland, Ohio

Furnace Switch—Automatic
Payne Furnace & Supply Co., Beverly Hills, Cal.

Furnaces—Gas
Calkins & Pearce, Columbus, Ohio
Lennox Furnace Co., Marshalltown, Iowa
Mueller Furnace Co., L. J., Milwaukee, Wis.
Payne Furnace & Supply Co., Beverly Hills, Cal.
Robinson Co., A. H., Massillon, Ohio
Rudy Furnace Co., Dowagiac, Mich.
Wise Furnace Co., Akron, Ohio

Furnaces—Oil Burning
Motor Wheel Corp., Heater Div., Lansing, Mich.

Furnaces—Warm Air
Agricola Furnace Co., Gadsden, Ala.
American Fdy. & Furnace Co., Bloomington, Ill.
American Furnace Co., St. Louis, Mo.
The Beckwith Co., Dowagiac, Mich.
Brillion Furnace Co., Brillion, Wis.
Enterprise Boiler & Tank Works, Chicago, Ill.
Farris Furnace Co., Springfield, Ill.
Forest City-Walworth Run Fdy., Cleveland, Ohio
Fox Furnace Co., Elyria, Ohio
Henry Furnace & Fdy. Co., Cleveland, Ohio
Langenberg Mfg. Co., St. Louis, Mo.
London Furnace Co., London, Ohio
Lennox Furnace Co., Marshalltown, Iowa
Syracuse, N. Y.
May Fiebeger Furnace Co., Newark, Ohio
Meyer Furnace Co., The, Peoria, Ill.
Midland Furnace Co., Columbus, Ohio
Motor Wheel Corp., Heater Div., Lansing, Mich.
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Payne Furnace & Supply Co., Beverly Hills, Cal.
Premier Warm Air Heater Co., Dowagiac, Mich.
Peerless Foundry Co., Indianapolis, Ind.
Rybolt Heater Co., Ashland, Ohio
Rudy Furnace Co., Dowagiac, Mich.
Standard Fdy. & Furnace Co., De Kalb, Ill.
Success Heater Mfg. Co., Des Moines, Iowa
Schwab Furnace & Mfg. Co., Milwaukee, Wis.
Waterman-Waterbury Co., Minneapolis, Minn.
Western Steel Products Co., Duluth, Minn.
Wise Furnace Co., Akron, Ohio

Gas Burning Attachments
Calkins & Pearce, Columbus, Ohio
Munkel-Rippel Heating Co., Columbus, Ohio

Grilles
Auer Register Co., Cleveland, Ohio
Harrington & King Perforating Co., Chicago, Ill.
Hart & Cooley Co., New Britain, Conn.
Tuttle & Bailey Mfg. Co., Chicago, Ill.

Guards—Machine and Belt
Harrington & King Perforating Co., Chicago, Ill.

Handles—Boiler
Berger Bros. Co., Philadelphia, Pa.

Handles—Soldering Iron
Hyro Mfg. Co., New York, N. Y.

Handles—Furnace Door
Fanner Mfg. Co., Cleveland, Ohio

Hangers—Eaves Trough
Apex Gutter Hanger Corp., New York, N. Y.
Berger Bros. Co., Philadelphia, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Heat Regulation Systems
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Tisch, Inc., Charles, Brooklyn, N. Y.
Sheer Co., H. M., Quincy, Ill.
White Mfg. Co., Minneapolis, Minn.

Heaters—Cabinet
Fox Furnace Co., Elyria, Ohio
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Motor Wheel Corp., Heater Division, Lansing, Mich.
Payne Furnace & Supply Co., Beverly Hills, Cal.
Waterman-Waterbury Co., Minneapolis, Minn.

Heaters—School Room
Meyer Furnace Co., The, Peoria, Ill.
Western Steel Products Co., Duluth, Minn.
Waterman-Waterbury Co., Minneapolis, Minn.

Humidifiers
Automatic Humidifier Co., Cedar Falls, Iowa
Diener Mfg. Co., G. W., Chicago, Ill.
Meyer & Bro. Co., F., Peoria, Ill.
Sheer Co., H. M., Quincy, Ill.
J. L. Skuttle Co., Dowagiac, Mich.

Lath—Expanding Metal
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Machines—Crimping
Bertsch & Co., Cambridge City, Ind.
Yoder Co., The, Cleveland, O.

Machinery—Culvert
Bertsch & Co., Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.

Machines—Tinsmith's
Bertsch & Co., Cambridge City, Ind.
Dreis & Krump Mfg. Co., Chicago, Ill.
Hyro Mfg. Co., New York, N. Y.
Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
The Stanley Electric Tool Co., New Britain, Conn.
Whitney Mfg. Co., W. A., Rockford, Ill.
Yoder Co., The, Cleveland, O.

Metals—Perforated
Harrington & King Perforating Co., Chicago, Ill.

Miters—Eaves Trough
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Braden Mfg. Co., Terre Haute, Ind.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Nails—Copper and Brass
Chase Brass & Copper Co., Waterbury, Conn.
Revere Copper & Brass, Rome, N. Y.

(Continued on page 62)

BUYERS' DIRECTORY

(Continued from page 60)

Nails—Hardened Masonry

Parker-Kalon Corp., New York, N. Y.

Oil Burners

Berryman System of Oil Heating, Inc., Chicago, Ill.
Bettendorf Mfg. Co., Bettendorf, Iowa
Bock Oil Burner Co., Madison, Wis.
Mellvaine Burner Corp., Evanston, Ill.
Silent Automatic Corp., Detroit, Mich.

Paint

Connors Paint Mfg. Co., Wm., Troy, N. Y.

Perforated Metals

Harrington & King Perforating Co., Chicago, Ill.

Pipe and Fittings—Furnace

Henry Furnace & Fdy. Co., Cleveland, Ohio
Lamneck & Co., W. E., Columbus, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Peerless Foundry Co., Indianapolis, Ind.

Pipe and Fittings—Stove

Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Pipe—Conductor

Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Punches

Bertsch & Co., Cambridge City, Ind.
Hyro Mfg. Co., New York
Interstate Machinery Co., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
W. A. Whitney Mfg. Co., Rockford, Ill.

Punches—Combination Bench and Hand

Hyro Mfg. Co., New York, N. Y.

Punches—Hand

Hyro Mfg. Co., New York, N. Y.
W. A. Whitney Mfg. Co., Rockford, Ill.

Putty—Stove

Connors Paint Mfg. Co., Wm., Troy, N. Y.

Radiator Cabinets

Hart & Cooley Co., Holland, Mich.

Ranges—Gas

The Beckwith Co., Dowagiac, Mich.
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.

Registers—Warm Air

Auer Register Co., Cleveland, Ohio
Forest City-Walworth Run Foundries Co. Cleveland, Ohio
General Products Corp., Indianapolis, Ind.
Hart & Cooley Co., Holland, Mich.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Ku-No Register Mfg. Co., St. Louis, Mo.
Lamneck & Co., W. E., Columbus, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Mueller Furnace Co., L. J., Milwaukee, Wis.
Rock Island Register Co., Rock Island, Ill.
Symonds Register Co., St. Louis, Mo.
Tuttle & Bailey Mfg. Co., Chicago, Ill.
United States Register Co., Battle Creek, Mich.

Register Shields

General Products Corp., Indianapolis, Ind.

Registers—Wood

American Wood Register Co., Plymouth, Ind.
Auer Register Co., Cleveland, Ohio
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Regulators—Heat

Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
H. M. Sheer Co. Chicago, Ill.
White Mfg. Co., Minneapolis, Minn.

Ridging

American Rolling Mill Co., Middletown, Ohio
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Rivets—Stove

Lamson & Sessions Co., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Rods—Stove

Lamson & Sessions Co., Cleveland, Ohio

Rolls—Forming

Bertsch & Co., Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.

Roofing Cement

Connors Paint Mfg. Co., Wm., Troy, N. Y.
Lastik Products Corp., Pittsburgh, Pa.

Roof Paints

Lastik Products Corp., Pittsburgh, Pa.

Roof—Flashing

Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Roofing—Iron and Steel

American Rolling Mill Co., Middletown, Ohio
Central Alloy Division, Republic Steel Corp., Youngstown, Ohio
Inland Steel Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Ryerson & Sons, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Roofing—Tin

Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Taylor Co., N. & G., Philadelphia, Pa.

Rubbish Burners

Hart & Cooley Co., New Britain, Conn.

Schools—Sheet Metal Pattern Drafting

St. Louis Technical Institute, St. Louis, Mo.

Schools—Warm Air Heating

St. Louis Technical Institute, St. Louis, Mo.

Screws—Hardened Metallic Drive

Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Parker-Kalon Corp., 200 Varick St., New York

Screws—Hardened Self-Tapping, Sheet Metal

Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Parker-Kalon Corp., 200 Varick St., New York

Screens—Perforated Metal

Harrington & King Perforating Co., Chicago, Ill.

Scuppers

Aeolus Dickinson Chicago, Ill.

Shears—Hand and Power

Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Peck, Stow & Wilcox Co., Southington, Conn.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
The Stanley Electric Tool Co., New Britain, Conn.
Viking Shear Co., Erie, Pa.
Yoder Co., The, Cleveland, O.

Sheet Metal Screws—Hardened, Self-Tapping

Parker-Kalon Corp., 200 Varick St., New York

Sheets—Alloy

International Nickel Co., New York, N. Y.
Republic Steel Corp., Youngstown, Ohio

Sheets—Black and Galvanized

American Rolling Mill Co., Middletown, Ohio
Inland Steel Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Republic Steel Corp., Youngstown, Ohio
Rockford Sheet Steel Co., Rockford, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
Taylor Co., N. & G., Philadelphia, Pa.

Sheets—Iron

American Rolling Mill Co., Middletown, Ohio
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Republic Steel Corp., Youngstown, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Sheets—Tin

Taylor Co., N. & G., Philadelphia, Pa.

Shingles and Tiles—Metal

Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Sifters—Ash

Diener Mfg. Co., G. W., Chicago, Ill.

Sign Equipment—Electric

Metal Products Co., Milwaukee, Wis.

Sky Lights

Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Snips

Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Solder—Acid Core

Kester Solder Co., Chicago, Ill.

Solder—Self-Fluxing

Kester Solder Co., Chicago, Ill.

Solder—Rosin Core

Kester Solder Co., Chicago, Ill.

Solder

Kester Solder Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Soldering Coppers

Revere Copper & Brass, Rome, N. Y.

Soldering Furnaces

Diener Mfg. Co., G. W., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Specialties—Hardware

Diener Mfg. Co., G. W., Chicago, Ill.

Stars—Hard Iron Cleaning

Fanner Mfg. Co., Cleveland, Ohio

Tinplate

Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Taylor Co., N. & G., Philadelphia, Pa.

Tools—Tinsmith's

Bertsch & Co., Cambridge City, Ind.
Dries & Krump Mfg. Co., Chicago, Ill.
Hyro Mfg. Co., New York, N. Y.
Interstate Machinery Co., Chicago, Ill.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Peck, Stow & Wilcox Co., Southington, Conn.
Rockford Sheet Steel Co., Rockford, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
The Stanley Electric Too. Co., New Britain, Conn.
Viking Shear Co., Erie, Pa.
Whitney Mfg. Co., W. A., Rockford, Ill.

Torches

Diener Mfg. Co., G. W., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Trade Extension

Copper & Brass Research Association
National Association of Flat Rolled Steel Manufacturers, Cleveland, Ohio

Trimmings—Stove and Furnace

Fanner Mfg. Co., Cleveland, Ohio

Vacuum Cleaner—Furnace

Brillion Furnace Co., Brillion, Wis.
National Super Service Co., Toledo, Ohio

Ventilators—Floor

Aeolus Dickinson Chicago, Ill.

Ventilators—Roof

Aeolus Dickinson Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Paul R. Jordan & Co., Indianapolis, Ind.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Ventilators—Ceiling

Hart & Cooley Co., New Britain, Conn.
Henry Furnace & Fdy. Co., Cleveland, Ohio

Wood Faces—Warm Air

Auer Register Co., Cleveland, Ohio
American Wood Register Co., Plymouth, Ind.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Alphabetical List *of* Advertisers

Firms represented in this issue are identified by the folio of the page on which their advertising appears. Advertising which appears in alternate issues is marked with an asterisk.

THE BUYERS' DIRECTORY APPEARS ON PAGES 52 AND 54

WANTS AND SALES

Yearly subscribers to the AMERICAN ARTISAN may insert advertisements of not more than fifty words in our Want and Sales Columns WITHOUT CHARGE for three insertions.

Such advertisements, however, must be limited to help or situation wanted, tools or equipment for sale, to exchange or to buy, business for sale or location desired, and must reach our office ten days prior to date of publication. This privilege is not extended to manufacturers or jobbers—or those making a business of buying and selling used machines—employment agencies and brokers.

When sending advertisement state whether your name or blind number is to be used.

SITUATION WANTED

This is addressed to a manufacturer who harps on quality furnaces and intelligent installations. If such a manufacturer needs a sales manager or assistant sales manaer, I would like to hear from him. For ten years I helped market a well known furnace. Served in sales promotion and advertising departments, as a salesman, and as branch manager. Thorough investigation as to character and ability invited. Communications strictly confidential. Address A-529, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—Have traveled Wisconsin for prominent furnace company of St. Paul, have had ten years of specialty selling experience, and have worked Minnesota, Wisconsin, North and South Dakota, and Montana territory and have large acquaintance throughout this territory. Can figure house plans for warm air furnace work, and am familiar only with cast furnaces. Married, steady, reliable and sober. Address C-529, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By good combination mechanic, heating, plumbing and metal. Good salesman; would prefer job in shop when I can be at home part of time. Last 9 years on road installing heating and plumbing. Would like small town in South. Address B-529, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—Will operate branch or work with furnace manufacturer in Sales Department. Have installed furnaces for years. Am now managing local furnace shop. Can give good references of highest quality. What have you to offer? Address Mr. G. Van Horn, 1102 Heston St., Toledo, Ohio. G-529

Situation Wanted—By man 38 years of age. Eighteen years experience in all branches of warm air heating. Thoroughly understands forced, booster and gravity systems; can do own layout and drafting. Position wanted as salesman for a reliable furnace manufacturer or salesman and engineer for a dealer. Best of references furnished. Address X-529, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

SITUATION WANTED

Situation Wanted—By sheet metal worker with a good knowledge of pattern drafting. Can work from blue prints. Have had school heating and factory maintenance experience. Know the Standard Code. Am thirty-nine years old and married, sober and steady. Address H-529, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—If you answer this ad you will hear from a man who has had years of experience in the stove and furnace business—inside and outside, from shipping clerk to executive. A responsible position with possibilities is more important than location or large starting salary. Address J-529, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted — Thoroughly competent and reliable journeyman plumber, Illinois license, desires steady position year around. Also do steam, water and air heating if required. Am the kind of man who does the kind of work that pleases your customers and holds their trade. Try me. Address Mr. M. R. Trisler, 507 N. East St., Kewanee, Ill. F-529

Situation Wanted—By a first class sheet metal worker and furnace man. Not a floater—steady and reliable. Will work for board and transportation until March 1st. Address Y-529, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By an all around sheet metal worker experienced in all branches of the trade; cornice, skylight, gutter, ventilation and furnace work. Address H. Lense, 2800 Benton Street, Edgewater, Colo. P-529

HELP WANTED

Wanted—We need a sheet metal worker and a furnace man. A man that is steady and reliable, who understands heating and ventilating blue prints, and understands how to read blue prints. It is a steady job for the right man. Address Iverson Hardware Co., Vermilion, S. Dak. W-528

Wanted—An all around man, who can do furnace and plumbing, windmill, pump repair, roofing and guttering. Steady work year around. State wages, age and experience in application. Address S-529, AMERICAN ARTISAN, 139 Clark St., Chicago, Ill.

BUSINESS CHANCES

For Sale or Exchange—Will exchange a 240 acre farm in north central Iowa corn belt for an up-to-date hardware stock. Will take stock from $10,000 to $12,000 as first payment and would prefer northwestern Iowa or southern Minnesota location in town from 4,000 to 10,000 population or larger. This is an A-1 farm. Address T-528, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale — Sturtevant Furnace Vacuum Cleaner, $100 f.o.b. Detroit. Leaving for California is reason for selling. Address L-529, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

BUSINESS CHANCES

For Sale—Shop that has been established 40 years; town of about 12,000; first class work only produced in warm air heating, sheet metal roofing, and ventilating. Only 3 other shops in town. Address Mr. Clyde M. Howell, 208 W. Third St., Greensburg, Pa. T-529

For Sale—Tin Shop with living quarters. Well established and well equipped. Located in a live oil town. Buildings and stock will run about $3000. Some terms to reliable party. Address J. P. Monday, Box 751, Hobbs, New Mexico. W-529

BOOKS

Here are the two books that most sheet metal workers and contractors classify as the most complete books on Sheet Metal Pattern Cutting. The Universal Sheet Metal Pattern Cutter, Vol. 1, deals with every phase of inside work, including Heating, Ventilating, Blower and Exhaust Piping Connections, Marine Sheet Metal Work, Automobile Sheet Metal Work, Machinery and Belt Guards, etc., Mensuration applied to Sheet Metal Work, etc., with many features of construction and Labor-Saving Methods are also given in detail.

Vol. 2 deals with every form of Outside and Architectural Sheet Metal Work. A treatise on Drawing, Full Size Detailing and Lettering, Construction of Cornices, Skylights, Molding, Copings, Electrically Illuminated Signs, etc.

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Box M-529, American Artisan

TOOLS AND MACHINES

For Sale—Tinners tools including 30" square shears, 30" rolls; 30" stove pipe folder, 20" rolls; 20" bar folder, bench shears, and several small machines and stakes. Write for complete list if interested. Prices right. Will sell all or part. Address Lee and Seymour, 346 Russell St., Madison, Wis. Z-528

Wanted—One 30" or 36" squaring shear, Pexto make, in A1 condition and priced right. Address John P. Nelson, 647 South Belknap St., Mexia, Texas. L-528

For Sale—One No. 16 Lennox Throatless Shear with two sets of blades. Price $50.00. Address Mehl Brothers Sheet Metal Works, Coffeyville, Kans. M-528

Wanted—One 8' Cornice brake 14 or 18 Ga. and lighter. Address J. R. Wright, Audobon, Iowa. R-529

BOOKS

Manual of Automotive Radiator Construction and Repair, by F. L. Curfman and T. H. Leet —Anyone interested in Radiator Repairing will find the 185 pages of practical instructions and 120 illustrations showing actual construction and repairing a big help. In a condensed manner some four to five thousand answers to questions are given. It is thoroughly practical, as both authors are men of wide experience in this work. Printed in large, easy to read type. Measures 5¼x9 inches. Price $2.50. Order from Book Department, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Exhaust and Blow Piping, by Hayes—Exhaust and Blow Piping has had an unusually big demand. A fresh supply is now off the press and is in our hands for immediate delivery. It has an invaluable treatise on the planning, cost, estimation and installation of fan piping in all its branches, giving all necessary guidance in fan work blower and separator construction. 159 pages, 5x8. 51 figures. Cloth. $2.00. Order from Book Department, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Illinois.

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Patent Attorney
Barrister Bldg., WASHINGTON, D. C.

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If you would like to know more about this service, write AMERICAN ARTISAN or Platte Overton, care of this magazine.

MISCELLANEOUS

Wanted—Used home study course on Heating Ventilating Engineering at right price. Address K-529, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

We are open for an Exclusive Agency on Roof Paint in the states of New York and New Jersey. Address Stove Manufacturers Corporation, 184 Mulberry St., Newark, N. J. E-529

For Sale—Sheet Metal Design and Pattern Drafting Course. Address D-529, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

BOOKS

The Revised Edition of the New Metal Worker Pattern Book by Kittridge and Associates is one book that should be in every shop. As a reference book alone it is indispensible. Over 500 9x11-inch pages with 895 illustrations. It covers the principles underlying practically every problem that is likely to come up in daily practice. Beginning with the selection and use of drawing tools, the author explains linear and geometrical drawing so clearly that one who has had nop revious knowledge of arithmetic or drawing may understand these essentials and apply them. The most approved methods of pattern cutting are also given in the course of the work... Price, $6.00, postpaid. Order from the Book Dept., AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Standard Practice in Sheet Metal Work is the name of the big book written, compiled and published by the National Sheet Metal Contractors Association. It took years of hard, careful planning and work to produce this book. No other book like it—it describes and illustrates the standard method of designing, working and installing and erection of all forms of sheet metal work. Gutter construction of all kinds is shown in detail. Blow pipe work, skylight, roofing, cornice, ventilating, warm air heating, etc. It's the best $10.00 book investment you can make. No matter what other books you have you need this book. Order from the Book Dept., AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

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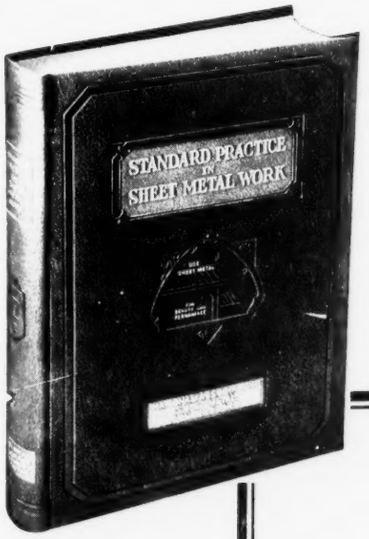

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